RECOGNITION OF EMOTIONAL EXPRESSION BY MALE PRISONERS

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ABSTRACT

Cross-cultural studies have repeatedly confirmed that the ability to recognise emotion in the facial expression of others is universal. Further research indicates that adult subjects can accurately identify six categories of emotion: surprise, fear, disgust, anger, happiness and sadness. The recent development of reliable stimulus material has enabled comparisons to be made in the ability of specific populations to recognise emotion in expressions.

Despite the findings of universality and that adults have the potential to recognise emotions accurately several studies indicate that specific populations show deficits in this ability (intellectually handicapped, right hemisphere brain injured, schizophrenic and affective disordered populations, abused children, and children rated as having low sociometric status).

Studies indicate that abused children and children of low sociometric status are "at risk" groups for later criminal deviancy. It might be expected, therefore that offender poulations show a deficit in emotion recognition ability. Research has however produced conflicting results regarding the social perceptual abilites of specific offender groups. This research has used a variety of methodological approaches which have not always taken into account the ability to recognise emotion in facial expression.

The present study examines the ability of male prisoners to recognise emotion in the facial expression of others. Seventy six inmates of a medium security prison were tested

using validated stimulus material. Results indicate that subjects convicted for predominantly violent offences recognise emotion with the greatest accuracy. Individuals convicted for sexual offences were found to be the least accurate. Those convicted for predominantly antisocial and drug offences and those convicted for dishonesty crimes differed little in terms of overall accuracy and fell midway between violent offenders and sexual offenders.

These results are discussed in the light of recent trends to provide social skills training for certain offender groups and Morrison & Bellacks' (1981) assertion that the ability to receive and process relevant inter-personal information is an essential prerequisite for effective social performance.

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PART ONE

LITERATURE REVIEW

1-1 CHAPTER ONE: HISTORICAL PERSPECTIVE

Many recognise Darwin's The Expression Of Emotion in Man and Animals as the starting point for over a century's research into the recognition of emotion through facial expression. Although he was not the first investigator to study the expression of emotion, he is the historical figure most closely associated with it (Winton, Putnam and Krauss, 1984). The central question Darwin addressed concerned the universality of facial expression, that is the extent to which they are independent of culture and learning. Darwin studied the accuracy with which facial expressions of emotion could be identified. Using photographs of facial expressions he requested observers to name the emotion shown. Such methods are still used today.

Another name associated historically with research into recognition of emotion in facial expression is that of Wundt. He postulated three basic affective dimensions of facial expression (excitement-calm , pleasantness - unpleasantness , tension - relaxation) (Wundt, 1904).

These two early writers represent a division in the research into facial expression which has remained until recently: namely that between viewing emotional expressions as specific categories (Darwin, 1872) as opposed to viewing them along various dimensions (Wundt, 1904).

1-1-1 Evolutionary Origins

The muscles involved in facial expression have their evolutionary origin in the muscles of the breathing apparatus (gill arches) of vertebrate fish. In fish the

function of these muscles is respiratory with some of the autonomic connections to these muscles remaining in humans. In submammalian land-dwelling animals these gill muscles become the sphincter coli muscle that encircles the neck. In mammals the muscles take their place on the head and form investments in the freely moveable facial skin and facia (Rinn, 1984). Thus evolution of the human face has moved in the direction of increasing expressiveness through greater visibility and flexibility of the facial musculature and of increasing differentiation of both the musculature and the patterns of neural innervation. From an organ involved specifically with respiration the face has evolved to aid maximal transmission of information to the self and others (Tomkins & McCarter, 1964). The information it transmits is largely concerned with affect.

1-1-2 History of Research

Ekman, Friesen & Ellsworth (1972), in their major review, differentiate three periods in the history of research into facial expression. During the first period (about 1914-1940) investigators such as F. Allport, Goodenough, Guilford, Landis, Munn and Woodworth were concerned with two issues: Does the face provide accurate information about emotion and are facial behaviours related to emotion innate or learned. Researchers such as Landis (1929) argued that the face was a poor source of information about emotion and that interpretation was dependent on knowledge of the eliciting circumstance. Such a view illustrates the popular belief of the time.

However, using emotional categories, Woodworth (1938), found that judgements made by observers did agree with

actors intended poses, suggesting that judgements could be made of facial expression without knowledge of context and that these judgements could be accurate. Using adjective checklists he established a six point linear scale of the following expressive categories: (1) love/mirth/happiness, (2) surprise, (3) fear/suffering, (4) anger/ determination, (5) disgust and (6) contempt. Later investigators published articles which continued to confirm that subjects could make accurate judgements of emotion thus challenging earlier negative findings (Fulcher, 1942).

The second period of research (1940-1960) saw a decline in the number of studies on facial expression. The period was dominated by the work of Schlosberg. A student of Woodworth, he departed from his teacher's interest in judgement studies to develop verbal dimensions which he considered to underlie Woodworth's emotional categories. He essentially bent Woodworth's linear scale into a circular one (Schlosberg, 1941), then reasoned (1952) that as a circular surface can be represented by two dimensions, recognition of emotion might be a two dimensional judgement process. These dimensions he labelled "pleasantness-unpleasantness" and "attention-rejection", drawing on the earier work of Wundt. He later added a third dimension "level of activation" or "sleep-tension" (Schlosberg, 1954).

During the second period the issues of accuracy and innate versus learned components of facial expression became dormant (Ekman, Friesen & Ellsworth, 1972). In the third period (1960 until the present) they surfaced again, influenced by the theory of Tomkins (1962, 1963)

which provided a rationale for studying the face as a means of learning about personality and emotion. Tomkin's theory argued that affective responses are the primary responses of human beings, that affects are primarily facial behaviours (as opposed to the James-Lange theory that assumes inner bodily responses are the site of emotions) and that one may respond with facial affective responses without necessarily becoming aware of the feedback from these responses.

Tomkins distinguished eight primary affects (each being named at both moderate and high intensity) : 1) interest-excitment, 2) enjoyment-joy, 3) surprise- startle, 4) distress- anguish, 5) fear- terror, 6) shame-humiliation, 7) contempt- disgust, 8) anger- rage (Tomkins & McCarter, 1964). Such an approach illustrates a category approach to classifying expressions where emotions are distinct and unrelated. Other investigators have adopted category approach and will be discussed below.

One outcome of Tomkins work was the finding that observers can obtain very high agreement if facial expressions are carefully selected to show what he believes are the innate facial affects (Tomkins & McCarter, 1964). Tomkins greatly influenced both Ekman and Izard whose work characterizes the type of research conducted over the last three decades (Ekman & Oster, 1979). Current investigations have revived issues which have remained dormant since the first period: issues of accuracy, early development and cross-cultural similarities (Ekman, Friesen & Ellsworth, 1972). Some investigators have continued the line of research initiated by Schlosberg. Russell (1980), for

example, proposed a "circumplex model of affect", where, similar to Schlosberg's model affective states are best represented as a circle in a two dimensional bipolar space. Recently research has become more interested in the judgement abilities of specific populations. These will be discussed below.

1-2 CHAPTER TWO: CONCEPTUAL ISSUES

Despite nearly one hundred years of research on recognition of emotion in facial expression by the 1960's there was still a number of important conceptual issues which were yet to be resolved. Earlier research was often methodologically unsound and results contradictory (Ekman, Friesen & Ellsworth, 1972). Specifically the topics of universality, dimensional versus categorical approaches to emotion, judgement and developmental studies will be discussed here. Also, to aid understanding of further research the development of facial measurement aids will be discussed. The following is intended as a brief overview of some of the more important issues:

1-2-1 Universality

Early issues approached by researchers were whether observers from different cultures label certain facial expressions of emotion in the same way and whether members of different cultures show the same facial expressions when experiencing the same emotion. Darwin (1872) postulated universality in facial behaviour on the basis of his evolutionary theory. Allport (1924), Asch (1952) and Tomkins (1962, 1963) also claimed universals in emotional expression (cited in Ekman & Friesen, 1971).

The alternative view that facial behaviours are culture specific and become associated with emotions through culturally variable learning was argued by Klineberg (1938) who noted how facial expressions in Chinese literature differed from the facial expressions associated with emotions in Western cultures. Other researchers have provided anecdotal examples of cultural differences (Ekman

& Friesen, 1971).

Despite evidence for the latter argument being largely anecdotal, Ekman (1968) and Ekman & Friesen (1969) attempted to reconcile these contradictory viewpoints within a framework which distinguishes between elements of facial behaviour which are universal and those which are culture specific. They hypothesized that the universals may be found in the relationship between distinctive patterns of facial muscles and particular emotions (happiness, sadness, anger, fear, surprise, disgust and interest) ie the way these emotions are physically expressed but that cultural differences would be seen 1) in some of the stimuli (antecedents), which through learning become elicitors of particular emotions, 2) in the rules for controlling facial behaviours in particular social settings and 3) in the consequences of emotional arousal.

To test this hypothesis Ekman & Friesen (1969) showed photographs of faces to college educated subjects in Brazil, the United States, Argentina, Chile and Japan. These subjects were found to identify the same faces with the same emotional words as were members of two preliterate cultures (the Sadong of Borneo and the Fore of New Guinea. Izard (1968, 1969), working independently and with a slightly different set of emotions and corresponding photographs obtained comparable results across seven other culture-language groups providing preliminary support for the universality hypothesis.

The strength of conclusions based on these studies was limited, however, due to the fact that all cultures compared had had some exposure to mass media portrayals of

facial behaviour suggesting members of these cultures might have learned to recognise the same set of conventions thus influencing the results. Ekman & Friesen (1971), therefore, studied members of the Fore linguistic- cultural group of the South East Highlands of New Guinea who had had only twelve years limited contact with missionaries and government workers. Subjects were selected to ensure maximum visual isolation from literate cultures. Results from this study also support Ekman & Friesen's earlier hypothesis that particular facial behaviours are associated with particular emotions regardless of culture or learning experiences.

Certain conclusions may be made about the universality of emotion in facial expression. Namely that 1) observers do label certain facial expressions of emotion in the same way regardless of culture and that 2) members of different cultures show the same facial expressions when experiencing the same emotion unless cultural display rules interfere (Ekman and Oster, 1979). The careful empirical approaches of both Ekman and his colleagues and Izard and his colleagues have led to the widespread acceptance of the proposition of universality in recognising facial expressions (Kilbribe & Yarcowzer, 1983). Both of these researchers, however, recognize the role that cultural factors play in modifying facial behaviour during social interaction. Research following Ekman's findings has focused on determinants of those cultural differences found in recognition of emotion from facial expression. Three studies provide an illustration of these differences.

One study (Ekman, 1971) found that when Japanese and

American students watched stress-inducing films alone they had virtually identical facial expressions. When subjects watched the film while talking about the experience with a research assistant from the subjects own culture however, there was little correspondence between Japanese and American expressions. It was assumed that in this later situation Japanese and American emotional display rules (culturally learned rules about controlling the appearance of emotions) were applied.

Kilbride & Yarcowzer (1980) studied six to seven year olds, nine to ten year olds and college students from the United States and Zambias' ability to imitate happy, sad, angry, afraid and sad facial expressions (of white U.S. adults). They found that imitation efforts were less accurate when someone was present than when no one was present in both cultures. Zambian students posed or imitated the facial expressions less accurately than did the American students when rated by judges from their own cultural group.

In a further study requiring college students from the U.S. and Zambia to assign emotional labels to facial expressions produced by imitation by U.S. and Zambian students, Kilbride & Yarcowzer (1983) found a bi-directional ethnic bias. They found that Zambian raters labelled the Zambian facial expressions with less uncertainty than the U.S. facial expressions and that the U.S. raters labelled the U.S. facial expressions with less uncertainty than the Zambian facial expressions.

These studies suggest that while there is considerable, consistant evidence that there are some facial expressions

of emotion that are universal, there is also evidence indicating the involvement of cultural rules in both display and recognition of facial expression. This accounts for the finding that emotional recognition is more accurate within a given culture than between cultures. Ekman & Friesen (1971) conclude that universals in facial behaviour associated with emotion can be explained from a number of non-exclusive viewpionts as being due to evolution, innate neural programmes or learning experiences common to human development regardless of culture. Each of these are included in Ekman's (1972) neuro-cultural model of facial expression of emotion.

This model, based on Tomkins (1962, 1963) theory of emotion suggests that antecedent events lead to patterns of neural firing which result in facial expression. The neural patterns and facial expression are innate. The antecedents to specific emotions are determined by culture, as are display rules which individuals invoke to control their facial expression in social settings. For example, taking the emotion sadness. Whether an event (antecedent) is judged as sad depends on cultural values. If it is judged as sad then the responding facial expression which results from neural firing will be the same regardless of culture. In a social setting however the facial response may be controlled, altered or distorted in keeping with the rules for displaying sadness in the individuals culture. Studies support the components of this model: universality of facial expression (eg Ekman, 1973; Boucher & Carlson, 1980) ; cultural variability in display rules (Friesen, 1972) and cross-cultural variability of antecedents of emotion

(Boucher & Brandt, 1981).

1-2-2 Dimensional Versus Categorical Concepts Of Emotion.

When studying the recognition of facial expression most investigators have used "judgement tasks". Two judgement procedures have been commonly used: 1) an emotion category task, in which the observer selects one category from a limited set for each example of facial behaviour and 2) a dimension task in which the observer rates each face on a series of scales (Ekman & Friesen, 1972). These two procedures reflect two distinct theoretical viewpoints about the recognition of facial expression. The assumption that affective states consist of independent monopolar categories has been included in Tomkins' (1962, 1963) and Izard's (1972) theory of discrete emotions, Ekman's (eg 1972) cross-cultural work and is the basis for self-report instruments most commonly used today in clinical, social and personality psychology to assess affect. The rigidity of the boundaries of these categories has, however, recently been challenged (Russell, 1980). Both category and dimensional, as well as recent attempts at synthesis will be discussed here.

Those researchers who argue that facial expressions of emotion are categorical (Ekman, Friesen & Ellsworth, 1972; Ekman & Friesen, 1975; Izard, 1977) have produced ranges of responses which consist of sets of discrete responses. Researchers employing the categorical approach treat the face as if it serves to communicate denotative meanings. Thus at any given moment the face is believed to transmit a single class or category of meaning represented by such

affective states as happiness or sadness. These are referred to as "primary affects" (Tomkins & McCarter, 1964, p120). Ekman, Friesen & Ellsworth (1972) have reviewed various authors sets. Their findings will be briefly repeated here.

Woodworth (1938) proposed a set of ten emotional categories (love, mirth, happiness, surprise, fear, suffering, anger, determination, disgust, contempt). Plutchik (1962) proposed a set of eight emotional categories (coyness/ happiness/ joy, surprise/ amazement/ astonishment, apprehension/ fear/ terror, pensiveness/ sorrow/ grief, annoyance/ anger/ rage, tiresomeness/ disgust/ loathing, attentiveness/ expectancy/ anticipation, acceptance/ incorporation). Tomkins & McCarter (1964) proposed eight categories (enjoyment/ joy, surprise/ startle, fear/ terror, distress/ anguish, anger/ rage, disgust/ contempt, interest/ excitement, shame/ humiliation). Osgood (1966) proposed a set of forty emotional categories while Frijda's (1968) model used one hundred (See Table 1-1).

Emotion Categories Proposed by Five Investigators

Woodworth 1938	Plutchik 1962	Tomkins & McCarter 1964	Osgood* 1966	Frijda** 1968b	Proposed
Love Mirth Happiness	Coyness Happiness Joy	Enjoyment Joy	Complacency Quiet pleasure Joy Glee Worried laughter	Happy	Happiness
Surprise	Surprise Amazement Astonishment	Surprise Startle	Surprise Amazement Bewilderment Awe	Surprise	Surprise
Fear	Apprehension Fear Terror	Fear Terror	Fear Horror	Fear	Fear
Suffering	Pensiveness Sorrow Grief	Distress Anguish	Despair Boredom Dreamy sadness Acute sorrow Despair	Sad	Sadness
Anger Determination	Annoyance Anger Rage	Anger Rage	Sullen Anger Rage Stubbornness Determination	Anger	Anger
Disgust Contempt	Tiresomeness Disgust Loathing	Disgust Contempt	Annoyance Disgust Contempt Scorn Loathing	Disgust	Disgust/ Contempt
	Attentiveness Expectancy Anticipation	Interest Excitement	Expectancy Interest	Attention	Interest
	Acceptance Incorporation	Shame Humiliation	Pity Distrust Anxiety	Calm Bitter Pride Irony Insecure Skepticism	

* All categories which were found in at least two of Osgood's three types of data analyses have been listed.

** All categories which emerged in the analysis of judgments of both stimulus persons have been listed.

table 1-1 Emotion categories proposed by five investigators. (From: Ekman, Friesen & Ellsworth, 1972)

These category sets were devised by their authors using a variety of methods. Problems exist with all of them including: being based on small numbers (n = 2 to n = 11) of stimulus posers, limiting the observers choice of emotional category labels, using exclusively still photographs rather than motion pictures or video tapes. Despite these methodological problems, Ekman, Friesen & Ellsworth (1972) noted the high degree of consistancy over the studies and argued that together they could provide an indication of which categories were indeed valid. They noted that all investigators proposed a happiness category, a surprise category, a fear category and an anger category. All investigators except Woodworth proposed an interest category and a disgust/ contempt category. From this they proposed that seven categories of emotion could be judged from observations of posed, still photographs: surprise, fear, disgust, anger, happiness, sadness, and interest (The emotion interest was later dropped because there was insufficient evidence that its appearance was universal and its facial signs were subtle, making its appearance hard to show in still photographs, Ekman & Friesen, 1975). This, they argued appeared to be a minimal list with high validity considering the wide variety of theoretical and methodological bases from which it was obtained. It has gained considerable popularity amongst researchers and has been adopted in a large number of judgement studies using a category model (Russell, 1980).

Another researcher who has had considerable influence on other investigators is Carroll Izard (Izard, 1971; Izard, 1977). Izard (1971) proposed a list of nine fundamental

emotions including Ekman, Friesen & Ellsworth's basic six plus interest, shame and contempt and distinguishing between disgust/ contempt and disgust/ revulsion. While Izard's list remains popular (Wiggers, 1982) it has received criticism for the inclusion of some categories which have not been sufficiently validated.

Drawing from the work of Wundt, an alternative approach views facial expressions not as discrete monopolar categories but as points located on a small set of continuous scales or dimensions. Proponents of this approach have been concerned with answering the question: which dimensions of facial meaning constitute the most parsimonious and accurate representation of the kinds of information that can be communicated by facial expressions (Leathers & Emigh, 1980). In contrast to the category approach, where classes of emotion are said to be unrelated and unordered (Frijda, 1968), the dimensional approach views emotions as being comprised of various more fundamental elements depending on their position along a number of dimensions. These affective states are not considered as independent but are related to each other in a highly systematic fashion (Russell, 1980).

A leading proponent of this view, Schlosberg (eg 1954) proposed that emotions are organized along three dimensions which he labelled intensity, pleasant/ unpleasant and attention/ rejection which he argued were orthogonal. Evidence for the validity of the intensity dimension was insufficient so the model was reduced to a two dimensional one describing a roughly circular surface as noted above. In creating this model, Schlosberg had essentially joined

the two ends of Woodworth's (1938) linear model noting that the two end points tended to be confused with each other (Bullock & Russell, 1984).

Subsequent research has tended to support Schlosberg's model (Abelson & Sermat, 1962; Cliff & Young, 1968; Green & Cliff, 1975; Shepard, 1962). Various other dimensional models have been proposed (eg Daly et al, 1984; Plutchik, 1980; Russell, 1980; Zevon & Tellegen, 1982) but most retain the basic features of Schlosbergs: a circular structure with two underlying bipolar dimensions.

Some dimensional theorists (eg Frijda, 1968; Russell, 1980) argue that the dimensional approach is much closer to how people actually perceive faces in non-experimental settings. Russell's (1980) study provides provisional support for this. Responses from his subjects to photographs of Ekman & Friesen's six emotions could be plotted in a circular arrangement similar to Schlosberg's conceptualisation in finding that the layperson's map of affective space closely resembles the hypothesized model of Schlosbergs.

Ekman, Friesen & Ellsworth (1972) conclude that it is not possible to state whether a dimensional or category approach is preferable. It is likely that neither provide a conclusive picture of how facial expressions are recognised but that both contain elements for which there is proven validity. They advise that researchers choose on the basis of hunch, theoretical biases or preferred methods of data analysis. (The current study adopts the category approach because of the precedent set by other research using it and ease of data analysis). It is also likely that the

differences between the two approaches are not as great as once thought. Indeed recent attempts at combining the approaches suggest promising possibilities for future conceptualisations.

Frijda (1968), for instance, proposed a hierarchical conception where given an n-dimensional space, points (emotional categories) are differentiated in terms of dimensions meaningful only in that region, ie emotions within as well as across categories could well be comparable in terms of a number of dimensional properties such as pleasantness, intensity, attentional activity, involved complexity and integration into the stream of experience, while each category may still have something of its own such as the kind of attentional activity or the kind of unpleasantness.

Tomkins & McCarter (1964) suggested the same when they found, using categories, that subjects systematically confused some of the primary affects with others and that the categories could be ordered on the basis of these common confusions. Based on Russell's (1980) circumplex model, Bullock & Russell (1984) proposed three general properties of categories of emotion. The first is that the boundaries between emotion categories are not distinct, that is categories are 'fuzzy' rather than proper sets. They suggest that the facial expressions used by Tomkins, Ekman, Izard and their associates (Ekman, 1972; Ekman & Friesen, 1975; Ekman & Oster, 1979; Izard, 1971; 1977; Tomkins & McCarter, 1964) are 'prototypical' of the various categories, ie they are near the centre of emotional categories and are thus least likely to be confused with

members of other emotional categories or, put another way, they have a high degree of "belongingness" to a particular emotional category.

The second property of categories of emotion proposed by Russell & Bullock (1984) is that they are organized with respect to one another. The third property is that bipolar dimensions underlie the way in which emotional categories are inter-related.

Russell & Bullock, in a number of studies provide consistent evidence for these three properties (Russell, 1980; Bullock & Russell, 1984; 1985; Russell & Bullock, 1986). The compatability of the dimensional and categorical models in such a schema is illustrated by Russell & Bullock's (1986) inclusion of Ekman & Friesen's six prototypical emotions within a Schlosbergian two-dimensional space. They found that subjects judgements of the prototypical emotions and the confusions between them produced a circular ordering around the dimensions of pleasure and arousal. These studies will be discussed further in Section 1-2-5 on developmental studies (see Figure 1-1).

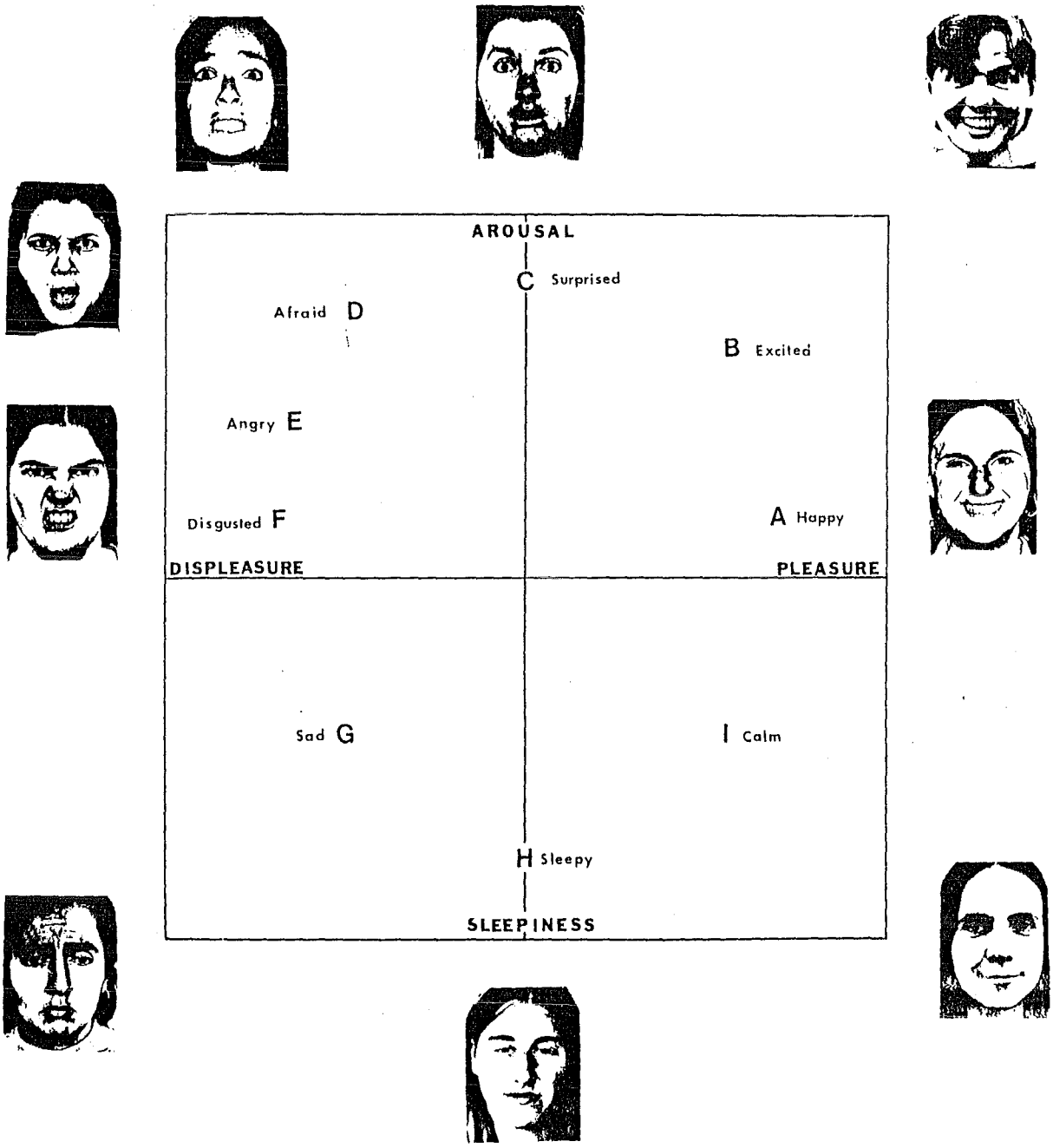

figure 1-1 A circular ordering of emotion.
(adapted from: Bullock & Russell, 1984)

1-2-3 Facial Measurement.

Many of the questions in current research on recognition of emotion require measurement of facial activity itself and cannot be answered solely by reliance upon observers judgements of emotion (Ekman & Oster, 1979). Research requires accurate measurement of facial behaviour to allow descriptions of expressions and standardization of stimuli. Three methods of measuring the faces visible action have been commonly used:

a) Facial Action Scoring Technique (FAST): The FAST specifies what Ekman, Friesen & Tomkins (1971) claimed to be the distinctive components of six universal affect expressions. It requires scoring of each observable movement in each of three areas of the face: 1) brows/ forehead area; 2) eyes/ lids; 3) lower face including cheeks, nose, mouth and chin. The aim of such a technique was to allow accurate descriptions and comparisons to be made of different facial expressions. The FAST suffered a number of flaws which seriously limited it however (Ekman & Oster, 1979). It was incomplete in its analysis of facial parts and behavioural units were given inference-laden names (eg angry frown) making objective study of the the actions meaning difficult.

b) Facial Action Coding System (FACS): Developed by Ekman & Friesen (1976; 1978) the FACS superceded FAST. FACS distinguishes between 44 'facial action units' (AU's). These represent minimal units that are anotomically separate and visually distinguishable. FACS also contains 14 more grossly defined action units of head and eye

positions. Any facial activity can be described reliably in terms of the particular AU's which singly or in combination produce it. In addition the amount of activity present in each AU can be scored on three levels of intensity (slight, moderate, extreme). Persons who have learned the system, without personal instruction from the authors have achieved high reliability (Ekman & Oster, 1979).

Using the detailed instructions from FACS, Wiggers (1982) instructed seven adults to pose facial expressions which portrayed happiness, fear, disgust, shame, sadness, surprise, anger and contempt with varying intensities. Thirty-nine observers rated the posed expressions. Their emotion classification and intensity ratings agreed highly with FACS-based predictions corroborating the descriptive and predictive validity of FACS for studies on perception and emotion.

The development of FACS has enabled reliable stimuli to be developed for use in judgement studies. The materials used in the present study are based on FACS instructions (Ekman & Friesen, 1975).

c) Facial Expression Scoring Manual (FESM): Izard (1971) developed the FESM along the lines of FAST but utilizing his own set of emotional categories. It suffers the same short comings as FAST and is also limited by the validity of the emotional categories involved and has thus been little used in research.

1-2-4 Accuracy.

An important question to consider when studying recognition of emotion in facial expression is whether the information provided by a person's face is an accurate

reflection of the emotion that that individual is experiencing at that moment and whether in turn these emotions can be judged with accuracy by others. Frijda (1968) suggests that there are two components to recognition. The first, she suggests, is the recognition of the production of an "identifying response" (eg a smile in response to a happy event). The second involves determining whether the smiling individual in the happy situation actually feels happy ie is the smile an accurate reflection of the emotion the individual is experiencing. Thus, for Frijda, recognition of emotion is a complex procedure of information processing and is illustrated in Figure 1-2.

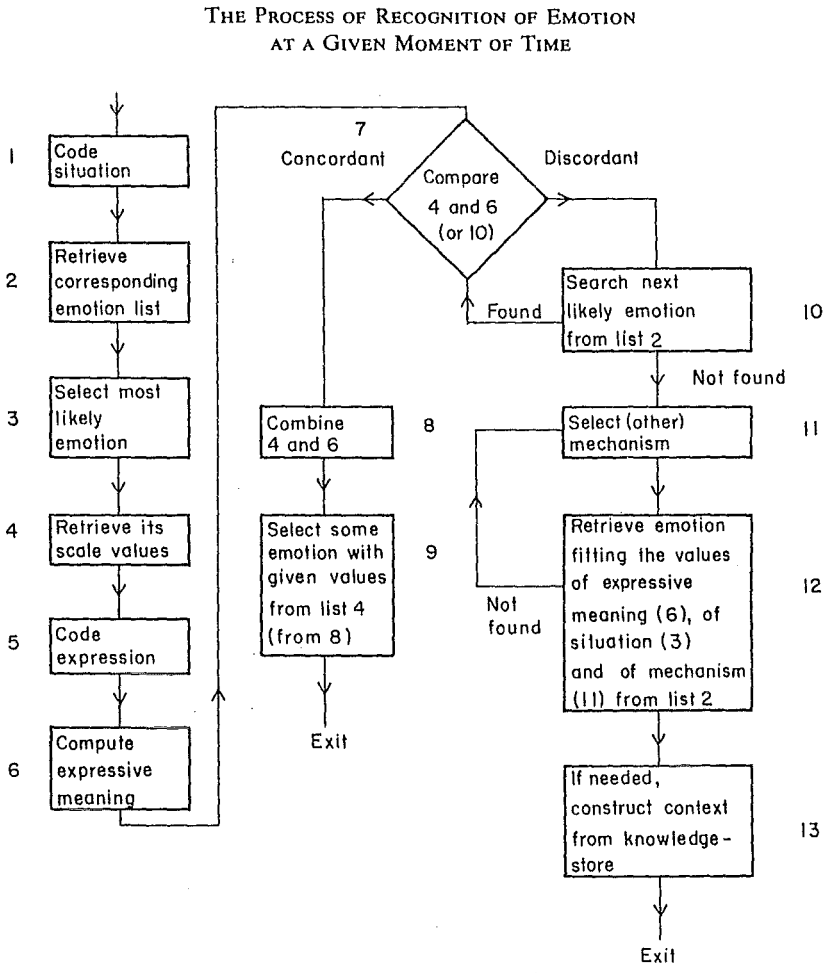

figure 1-2 The process of recognition of emotion.

(From: Frijda, N.H., 1968)

Many studies have addressed the issue of recognition accuracy. Most have been concerned with the first part of Frijda's two part process (ie the recognition of expressions as displayed in the face). Several have also addressed the issue of how accurately facial expression reflects underlying emotions. Some of these studies will be briefly discussed here:

Early reviews on the topic of accuracy of recognition (Bruner & Taguiri, 1954; Taguiri, 1968) painted a pessimistic picture claiming that some studies reported correct recognitions of emotions did not exceed the number that would be expected by chance. Ekman, Friesen & Ellsworth (1972) challenged these conclusions as well as the studies on which they wre based. Their reanalysis of earlier studies showed consistent evidence of accurate judgement of emotion from facial behaviour. They found that evidence based on posed behaviour was far stronger than that based on spontaneous behaviour (This is hardly surprising as posed behaviour represents a pure form of behaviour which is free from contaminating information and which is likely to represent a prototypical example of an emotional expression. .

Subsequent studies have confirmed that subjects can accurately and reliably identify specific and fundamental emotions as they are expressed in facial stimuli (Ekman, 1982 ; Ekman & Oster, 1979; Izard, 1971; 1977). However these do not answer the question of whether the expressions accurately identified truely reflect what the poser is feeling. To answer this some researchers (see Ekman & Oster, 1979) have employed self-report techniques which are

open to the usual criticisms of self-report studies. Other findings are also limited by the methodologies used. Buck, Savin, Miller & Cauls' (1972) study is an exception. Here subjects ('signal subjects') observed stimulus materials (slides) and self-rated their emotional response to them. These subjects were observed by another group of subjects ('observer subjects') who noted what emotions they detected via the signal subjects faces. Results indicated that observer subjects could accurately judge the signal subjects facial expression and that these judgements correlated highly with the self-reports of experienced emotion (rated as pleasant or unpleasant).

Leathers & Emigh (1980) in testing the Facial Meaning Sensitivity Test (a test of decoders ability to identify "highly specific meanings" communicated by facial expressions), found that subjects could accurately identify a number of emotions including Ekman & Friesen's six prototypes plus a number of "more subtle shades of meaning that, presumably, are part of broader classes", eg bewilderment and determination. They conclude that facial expressions can provide the decoder (observer) with extremely precise kinds of information about the communicator's emotional state. They add that decoders were able to distinguish among highly specialized kinds of facial meaning with a degree of precision not previously thought possible.

Ekman & Oster (1979) are a little more guarded in their conclusions after reviewing the literature. They conclude that facial expressions of emotion can provide accurate information about the occurence of pleasant as compared to

unpleasant emotional states but that the only evidence suggesting that facial expressions provide accurate information about distinctions among several positive and negative emotions comes from studies using posed rather than spontaneous expressions (eg Zuckerman, Hall, DeFrank & Rosenthal, 1976). They also add that facial expressions can be disguised to mislead an observer about emotions experienced and that studies have yet to show in what situations one can expect facial expressions to provide accurate information about actual experienced emotion.

It appears, then, that subjects are able to accurately recognise emotion in the facial expression of others particularly when these are posed and of a 'prototypical' nature but that such recognition does not take into account attempts of deception on behalf of the encoder or communicator. One can also conclude that accuracy varies between different populations. These variations will be discussed in more detail below. As will be shown in the remainder of this review, accuracy of recognition can be influenced by a number of factors, including developmental stage of the decoder, environmental or situational factors and characteristics of the population of the decoder. The final section of the present chapter examines the considerable research into the development of recognition abilities.

1-2-5 Developmental Studies.

The demonstration of cross-cultural aggreement about adult facial expressions of emotion has provided new incentives for infancy research in that findings of universality have implied biological patterning (Ekman,

1972). This has led to an interest in studying infants and children to determine the existence and development of skills in recognition of facial expression. Studies have attempted to ascertain what skills of emotional expression and recognition are present at birth and to plot the development of these skills over the life-span.

Several studies have focused on the ability of infants to produce facial expressions. Reviewing the literature up to 1979, Ekman and Oster (1979) made a number of conclusions regarding the ability to express emotion. They noted that facial musculature is fully developed at birth. Oster & Ekman (1978) had confirmed that all but one of the discrete facial action muscles visible in the adult can be identified and finely discriminated in full-term and premature neonates. Ekman & Oster claim that distinctive facial expressions resembling certain adult expressions are present in early infancy. New-born infants have been found to show expressions resembling distress (crying), disgust (in response to unpleasant tastes), startle (in response to sudden intense stimulation) and social smiling.

More recently Malatesta & Haviland (1982) found, using descriptive data, that infants of three or six months display a range of discriminable emotions including enjoyment, sadness, interest, distress, pain and surprise. Further they demonstrated that changes occur in emotional expression in early infancy that are indicative of instruction in facial display. They argued that mothers behaved to moderate the emotional expressions of their infants and that mother-infant interactions could account for the direction of change in display rule acquisition.

Ekman & Friesen (1975) suggest that display rules govern the manner in which emotions may be expressed and that these rules are internalized as a function of an individuals culture, gender and family background. This study suggests that such socialization begins at an early age. It seems then that the ability to produce facial expressions which represent emotions is present at birth and continues to develop during infancy. A number of other studies have confirmed that infants are able to discriminate among different facial expressions (Caron, Caron & Myers, 1982; Field, Woodson, Greenberg and Cohen, 1982; Izard, Vietze and Parisi, 1976). These studies provide no information about what, if any, meaning infants attatch to the emotions they discriminate.

A number of recent studies have focused specifically on childrens ability to recognise emotional expressions. Odom & Lemond (1972) descibe a developmental pattern where by the ability to produce facial expressions lags behind the ability to perceive them. They found that the lag was demonstrated for most but not all emotions. Moreover they found no reduction in this lag with increasing age, production not improving with age to the extent that discrimination does. Studies reviewed by Ekman & Oster (1979) reveal that differential responses to facial expressions (happy versus neutral, surprise or angry have been shown in three to four month olds and that imitation of some expressions is possible at two to three weeks. Preschool children have been found to know what the most common facial expressions look like, what they mean and what kind of situations typically elicit them. Performance

on recogntion, discrimination, affective role-taking and empathy has been shown to improve from ages three to ten as does the ability to imitate and voluntarily produce facial expressions to the satisfaction of adult judges (Charlesworth & Kruetzer, 1973). A recent study has focused on children's ability to recognise emotion. Felleman, Barden, Carlson, Rosenberg & Masters (1983) required two geographically distinct groups of children between the ages of four and five years and two samples of adult university undergraduates to rate slides of children presenting posed and spontaneous expressions of happiness, sadness, anger and neutrality. They found that adults were much more accurate than children in recognising neutral states, slighty more accurate in recognising happiness and anger and equally accurate in recognising sadness. Excluding childrens low accuracy in recognising neutral displays of emotion, Felleman, Barden, Carlson, Rosenberg & Miller suggest the pooled accuracy of their two sample groups (55%, 70%) is considerably higher than previously estimated in the literature based on childrens ability to decode adults emotional states.

Considerably earlier Gates (1923) reported that four year old children recognised posed expressions of happiness 70% of the time and anger 40% of the time. Accuracy was found to increase with older chidren. Charlesworth & Keutzer (1973) have noted that knowledge in this area has not progressed much further than confirming Gates' findings. Odom & Lemond (1972) found that five year old children were able to correctly identify only 41% of the emotions depicted in a standard set of emotions. A recent

series of studies by Bullock and Russell (Bullock & Russell, 1984; 1985; Russell & Bullock, 1986) suggest that earlier studies may have underestimated childrens knowledge of emotions. These studies provide a valuable illustration of how recognition skills develop during childhood.

Utilizing Russell's (1980) model of emotion where adjectives representing emotional expressions fall into a circular order in a two dimensional space and using Ekman's (1976) stimuli Bullock and Russell (1984) asked children to select from the series of photographs, faces which showed fear, anger, sadness, happiness, surprise and disgust. Additional terms were used to fill out the circular model. Three choices for each category were made. Thirty-eight subjects from each of the following age groups were used: three year olds, four year olds, five year olds and college aged adults. When choices made were evaluated as accurate or inaccurate (depending on agreement with an adult norm) results were typical of those reported above. Adults chose the 'correct' photograph 68-100% of the time. Children were most accurate on happy and sad (45-86% accuracy), reasonably accurate on mad and angry (44-53% accuracy) and less accurate on all the other words. Three year olds scored better than 50% only for happy; four year olds only for happy, relaxed and sad and five year olds for happy, sad, excited, mad and angry.

When the results were analysed, using a Chi-square test, to compare the actual frequency with which a word is associated with the faces against a frequency to be expected with random responding it was found that choices were clustered in an orderly fashion. The results indicated

that children perceive emotional expressions as organized in the same way as adults do but at the same time are inaccurate in their use of emotional words. Bullock and Russell (1984) argue that this suggests that children organize different facial expressions with respect to each other long before they are good at providing accurate labels for the expressions. They hypothesized that however emotional expressions eventually come to be categorized, they are first perceived in terms of pleasure and arousal rather than in terms of specific categories. Furthermore they suggest that children's subsequent developmental task is learning qualitative differentiations between facial expressions and more precise meanings of emotional words. Such development, they argue, is illustrated in their results by the narrowing of the focal points of emotional categories.

A subsequent study by Bullock and Russell (1985) required children and adults to classify Ekman's (1976) stimuli into categories (fear, anger etc) and then dimension (pleasure, arousal). They showed that adults can judge similarity between facial expressions according to pleasure and arousal dimensions and also place facial expressions into categories. When categorizing expressions adults almost always picked the prototypical expression for an emotional category. When members of one category were also judged to be members of other categories these were not seen as 'errors' but as an indication that adult's categories of emotion are overlapping sets with 'fuzzy' boundaries. The pattern of overlapping among categories is interpretable in terms of pleasure and arousal.

The five year olds in the study were also able to classify expressions in terms of categories and dimensions. Their categories were however slightly broader than those of adults. Four year olds, in turn, produced slightly broader categories than five year olds. The increase in breadth ocurred along the lines predicted by the structural model, that is, by way of similarity of pleasure and arousal.

Three year olds demonstrated knowledge of both categories and dimensions, however their categories were considerably broader than those of older subjects. [The category labelled 'surprise' included Ekmans 'surprise' and 'happiness' reactions. 'Scared' included Ekman's 'fear' and 'surprise' expressions. 'Mad' included Ekman's 'anger' and 'fear'. 'Disgust' included Ekman's 'Sad' and 'disgust' expressions. 'Sad' included Ekman's 'sad' and 'disgust' expressions]. The two year olds in the study had difficulty with the category and dimension tasks and their results were inconclusive.

These results support a model whereby boundaries separating different emotional categories are fuzzy and where categories are inter-related in a systematic order based on their degree of pleasure and arousal. With age subjects concepts of the categories become more narrow and distinct.

A third study, Russell and Bullock (1986) used a simpler procedure than in Bullock and Russell (1985) to gather information from two, three and four year olds. Using photographs of female posers selected from Ekman and Friesen's (1976) collection children were required to 1)

pick a card most different from one other ,2) divide the cards into two groups on the basis of similarity, 3) divide the cards into three groups on the basis of similarity and 4) divide the cards into five groups on the basis of similarity. The results indicate that even two year olds produced results consistant with a circular ordering in terms of pleasure and arousal dimensions.

These three studies represent an important development in the study of recognition of emotion in facial expression for two reasons. First they successfully combine two theoretical approaches and provide empirical data to support such a combination and secondly, in doing so they present a comprehensive framework in which to examine the development of recognition skills from birth to adulthood.

Taken together, these developmental studies suggest that the ability to produce facial expressions is present soon after birth. The ability to discriminate facial expressions in others is also present at an early age and continues to develop during infancy and childhood. Chidren show increasing discretion with increasing age in recognition tasks and by adulthood are able to discriminate with a high degree of accuracy between different emotional categories. Errors made by adults in categorising emotions may be interpretable as evidence that adults categories of emotion are overlapping sets with "fuzzy" boundaries. These findings have implications for studies concerned with the accuracy of specific populations in recognising emotion in facial expression (including the present study) in that populations where the opportunity to fully learn to recognize emotion in facial expression show lasting

deficits in this skill.

1-3 CHAPTER THREE: METHODOLOGICAL ISSUES.

It has been shown (Ekman, Friesen & Ellsworth, 1972) that the way in which research is conducted can influence the outcome of judgement study results. This is an indication that accuracy of recognition is influenced by environmental or situational factors. Several important variables will be discussed here but first judgement studies need to be differentiated from other types of studies of facial expression.

1-3-1 Judgement versus Component Studies.

When reviewing the literature on research on the face and emotion two separate research approaches are evident. In component studies, facial behaviour is treated as a response and research is concerned with whether a certain position or movement of the subject's face is related to some measure of the subjects emotional state or circumstance. In judgement studies, facial behaviour is treated as a stimulus and research is concerned with whether observers who judge a subject's face can agree about the subject's emotion or can distinguish between facial behaviours emitted under different emotional states or circumstances (Ekman, Friesen & Ellsworth, 1972).

Judgement studies, however, invariably incorporate a component feature within them in that they involve the use of stimulus material which connects facial behaviour to eliciting circumstances. If a judgement study finds that the observers were accurate, then it can be inferred that a component study of the same facial behaviour would find that the faces varied with the eliciting circumstance. If a judgement study is not successful (ie observers disagree or

are inaccurate rather than accurate) then two interpretations are possible. Firstly, it might be concluded that the stimulus facial behaviour is not related to eliciting circumstances and that observers are judging correctly. Secondly, it might be concluded that the information was correctly presented in the face but that observers incorrectly judged it. This situation proved to be s short-coming of early experiments (eg Landis, 1924; Sherman, 1927) where stimulus material often consisted of photographs from magazines, artist's drawings and photographs taken by the experimenters. Recent developments of stimulus material (eg Ekman & Friesen, 1976) which have been consistently validated allow comparisons to be made between observers ability to judge expressions shown in faces. Using these stimuli discrepancies may then be attributed to the observers judgement capabilities. The remaining issues are concerned primarily with judgement studies.

1-3-2 Types of Stimuli.

As mentioned above a wide variety of stimulus materials have been used in recognition studies of facial expression. Munn (1947) used magazine selections , Coleman (1949) used a small series of laboratory produced reactions while Brosgole, Kurucz, PlaHovinsak, Sprotte and Haviliwaln (1983) used schematic drawings.

The vast majority of studies have used still photographs of posed expressions as stimulus material. Posed facial expressions have at least three advantages for testing purposes. They are relatively easily acquired, the communicators intended meanings are likely to be clear and

are not likely to be distorted or modified by cultural display rules (Leathers & Emigh, 1980). A review of studies using posed behaviour (Ekman, Friesen & Ellsworth, 1972) showed that accuracy of judgements using this material is greater than chance. Tomkins & McCarter (1964) suggest that posed photographs fail to accurately represent affective responses. They suggest that for each model some affects are inhibited making it difficult for them to mimic and that further, each face has a predominant expression which contaminates the attempts to pose an affect. As far as is known this issue has never been specifically followed up by research. Most research, however, indicates that posed expressions are recognised with greater accuracy than spontaneous expressions and that there is a relationship between posed and spontaneous expressions. Further, development of the FACS (discused above) has enabled the development of posed stimulus material whereby models are instructed not by means of requesting an emotion (allowing the posers interpretation and idiosyncracies to influence the result) but by instructions to alter or move specific action units. A number of studies which have compared the use of posed and spontaneous expressions in judgement studies are reported here.

Buck (1975) videotaped childrens spontaneous expressions while they viewed affect inducing slides and obtained posed expressions by instructing children to role-play different affective states. Feinman & Feldman (1982) employed Buck's slides and found that preschoolers posed expressions were more recognizable than their spontaneous productions.

Zuckerman, Hall, DeFrank & Rosenthal (1976) questioned

whether results of research on posing could be generalized to spontaneous non-verbal behaviour. They compared individuals abilities to encode and decode spontaneous versus posed expressions. Their results indicated that posed behaviour provides the higher level of communication accuracy. They suggest that posed behaviour is related to spontaneous behaviour and thus both modes of sending involve similar skills.

Felleman, Barden, Carlson, Rosenberg & Masters (1983) studied childrens ability to recognize posed versus spontaneous expressions of emotion. They found that contrary to Zuckerman et al (1976), children's spontaneous displays of happiness were more readily recognizable than posed displays but that for other emotions there was no difference in recognizability between posed and spontaneous productions.

Ekman, Friesen & Ancoli (1980) applied the Facial Action Coding System to videotapes of subjects viewing positive and stress-inducing motion pictures. They found that facial expressions were differentiated for the spontaneous occurence of particular emotions.

Collectively these studies confirm the relationship between posed and spontaneous expressions. Generally posed expressions are more readily recognized than spontaeous expressions. This is hardly surprising considering that posing is solely intended to transmit information whereas expressing an emotion while viewing a video is not. Further, posing is less influenced by display rules which may deintensify, mask or neutralize the expression. It should be noted also that all the above studies utilized

spontaneous expressions produced in a laboratory which may not be representative of some naturally occuring behaviour. Apart from those studies utilizing magazine photographs, no studies have focused on expressions in naturally occuring, spontaneous situations.

The majority of judgement studies will continue to use posed behaviour due to its favourable reliability and validity. A possible limitation of using posed behaviour in judgement studies is that judgement accuracy may, if anything, be over-estimated.

1-3-3 Means of Presentation.

Using posed still photographs of facial expression most judgement studies presented stimulus material by way of photographic prints or slides. Using the former the procedure generally involves presenting the subject with a set of photographs and requesting him/her to select the appropriate one according to category labels. Using slides expressions are presented one at a time and the subjects are required to label the expressions.

Using slides allows the researcher to control the duration for which the subject observes the expression. Gard, Gard, Dosset & Turone (1982) used a tachistoscopic shutter to reduce exposure time to 200 ms to approximate actual inter-personal communications where facial expressions exist only very briefly. Indeed Kirouac & Dore (1984) showed that some subjects could accurately judge emotional expressions at exposure times as short as 10 ms. Judgement improved with increasing exposure time.

1-3-4 Characteristics of Poser.

A number of studies have reported that the personal characteristics of the poser may influence subjects ability to recognise expressions. Buck, Savin, Miller & Caul (1972) and Zuckerman, Lipets, Koivumaki & Rosenthal (1975) found that females were superior to males in their ability to encode affective expressions, however, Knudsen & Mazekari (1983) only found significant sex of encoder differences for two emotional categories (fear and sadness), and these were not consistent.

Generally studies addressing this issue have not done so specifically but rather in addition to measuring changes in other variables. Methodologically they have thus been compromised and hence results are inconclusive. They do however give an indication of the variables it is necessary to control to produce a properly conducted judgement study. The possibility of poser characteristics influencing judgement ability reinforces Ekman, Friesen & Ellsworth's advice to use many and varied subjects in judgement studies. Whilst the way in which judgement studies are conducted has been shown to influence the outcome of accuracy scores, in the following section (1-4) it will be shown that such scores also vary due to the characteristics of the research population.

1-3-5 Influence of Context:

Bruner and Taguiri (1954), in their review claimed that "virtually all the evidence available points to the fact that the more information about the situation in which the emotion is expressed there is, the more accurate and reliable are judgements of emotion" (cited in Ekman, Friesen and Ellsworth, 1972, p136). Subsequent research has tested this contention and found it to oversimplify the issue. Ekman, Friesen and Ellsworth (1972) argue that the data does not support this claim and suggest that Bruner and Taguiri failed to distinguish between concordant and disconcordant combinations of facial expressions and situations. Further they claim that understanding judgements of combined sources requires research on the information from each source alone as well as their combination. Summarizing the literature they conclude that on occasions either source (face or context) can be more salient, more useful or more of a determinant of the combined judgement than the other and that more information about the situation does not necessarily lead to more accurate judgements of emotion.

Spignesi and Shor (1981) repeating an earlier study found their data did not support a direct combinational model where face and context are taken as two distinct pieces of information and combined to form the overall judgement. Neither information from the face nor context was found to be consistently dominant in influencing judgements.

Concerning the influence of verbal statements of context on recognition tasks, Ekman, Friesen, O'Sullivan and

Scherer (1981) found that no one channel was dominant, rather the judgement of verbal and non-verbal behaviour was a function of the situation in which they were shown.

Knudsen and Muzekari (1983), studying the effects of verbal statements of context on recognition found that there was significantly greater agreement on the meaning of facial expression when they were accompanied by congruent verbal statements than when they were viewed alone but that agreement was significantly less when they were accompanied by incongruent verbal statements than when they were viewed alone. The authors claim their results lend weight to Ekman and Friesens' (1975) theory of the role of personal and cultural display rules which are governed by contextural factors such as preceding and subsequent behaviours, behaviour of other interactants, the situation and its social "frame" and social norms.

Currently, then, it appears that situational and contextural information does influence judgement of facial expression. Neither facial behaviour or contextural information have been found to be consistently dominant over the other nor do they combine consistantly in a purely additive way. Rather information is blended in a way dependent on the emotions shown, situational factors evident, the congruency of these factors and the individuals involved. Research supports Ekman, Friesen and Ellsworths (1972) theory that accurate informatiom can be obtained from the face alone.

1-3-6 Conclusions

The above studies show that a variety of factors external to the decoder can influence his/her accuracy of emotional recognition. These findings have had an effect on the way subsequent research has been planned. The type of stimulus material used influences judgement making comparisons between studies which use different stimuli difficult. Stimulus material developed by Ekman & Friesen has assisted the standardization of judgement studies. But this material utilizes posed photographs and while it has been shown that posed behaviour is related to spontaneous behaviour accuracy of judgements may be overestimated by it use. Presentation of posed material can be assisted to approximate reality by the use of a tachistoscope allowing expressions to be exposed for a brief duration. Studies have also shown that characteristics of the actual poser can influence judgements so that researchers need to heed Ekman, Friesen & Ellsworths' advice to use as wide a range of posers as possible. The use of posed stimulus material avoids confounding factors which situational and contextural information may add to judgements.

1-4 CHAPTER FOUR: RESEARCH WITH SPECIFIC POPULATIONS.

With a growing body of convincing evidence that recognition of emotions in facial expression is a universal phenomenon and that adult subjects are able to recognise expressions of emotion with potentially a high degree of accuracy an increasing number of studies have examined what features of various subject populations effect their recognition ability. Research has focused on what charateristics of the population influence their ability to recognise emotion. A number of the more important studies will be discussed in turn under relevant headings.

1-4-1 Sex Differences

Based on cultural expectations that women have greater social insight and empathic ability than men it has been suggested that females may be more accurate receivers of emotional information than males. Studies which have addressed sex differences in the ability to recognize emotion have produced contradictory results.

Buck, Savin, Miller & Caul (1972) in a study described above, found that female pairs of senders and observers were more effective in the transmission and reception of non-verbal emotional cues than were male pairs. They also found a contrast between 'internalizers', who showed little overt affect but produced high electrodermal activity in an emotion-provoking situation and 'externalizers', who displayed affect overtly but had minimal changes in skin activity. They found that females tended to be externalizers while males tended to be internalizers. It is unclear from this study whether the results were due to females being more facially responsive than males or to

females being more sensitive to the facial responses of others or to both of these factors.

A following study by Buck, Miller & Caul (1974) attempted to counter some of the shortcomings of the 1972 study by using all possible combinations of males and females in the positions of sender and observer to determine which particular factor was responsible for the superior accuracy among females. They found that female senders showed more accurate communications than male senders but that female observers were not reliably more accurate than male observers suggesting that the superior communication among female pairs in Buck, Savin, Miller and Caul (1972) was due to the greater responsiveness of female senders. The tendancy for males to be internalizers and females to be externalizers was repeated in this study.

Gallagher & Shuntich (1981) also found their female subjects to be better senders but not significantly better receivers of non-verbal expressions whereas Hall, DeFrank & Rosenthal (1976) using a similar design to Buck, Savin, Miller & Caul (1972) involving videotaping senders posed and spontaneous expressions, found that females were significantly better decoders but not significantly better encoders than males. The authors offer no explanations for the difference between theirs and earlier results. Cunningham (1977) also found females to be better decoders but not encoders.

Using a similar design as Buck, Savin Miller & Caul (1972) but adapted for children aged 4-6, Buck (1975) found that while the children showed a strong tendency to select sex appropriate games when asked about a series of twenty

activities (suggesting identification with traditional sex roles) there was no evidence for large sex differences in expressiveness in these children. Buck suggests a possible explanation for this result could be that expressive behaviour takes time to learn and that the children were too young to show sex differences. A short coming of this study was its use of only a small number of subjects (n = 15).

Field & Walden (1982) found no meaningful effects for infants (3-5 years) ability to produce and discriminate facial expressions. A recent study by Cupchik & Poulous (1984) found no significant difference between males and females in terms of overall expressivity when subjects were shown a selection of photographs which had been judged by other subjects as stimulating a very high intensity or a very low intensity of the particular emotion. Females, however, displayed more expressive behaviour in response to strong rather than weak stimulus whereas males showed no such modulation of their expressive behaviour in response to variations in stimulus intensity.

Many other studies have examined sex differences in encoder and decoder abilities but it is beyond the scope of the present review to discuss them all. Reviewing the literature on sex differences in decoding nonverbal cues Hall (1978) concluded that more studies showed a female advantage than would be likely to occur by chance and that on a variety of conceptually similar tasks females are reliably more accurate than males but that the difference is not large (0.4 SD). It appears however that studies prior and consequent to the review provide contradictory

evidence.

1-4-2 Age

As studies discussed above (Developmental Studies) show, the ability to accurately discriminate specific emotions in facial expressions increases with age in children. At the other end of the life span Brosgole, Kurucz, PlaHovinsak, Boettcher, Sprotte & Haveliwala (1983) compared the performance of senile geriatrics to that of normal preschool children (36-62 months) on a recognition task to determine whether recognition ability declines with age. They found that geriatrics differed significantly from even the youngest group of children (36-38 months) both in the number and type of error made. The geriatric group made significantly more errors than the three year olds. However where children made most of their errors with sad faces geriatrics made most of their errors with angry faces. The authors suggest that prosopo-affective agnosia (loss of the ability to recognise affect in faces) is a symptom associated with the process underlying senile dementia rather than simply a regression to an earlier stage of perceptual development. It seems then that once an individual reaches adulthood their is little decline in the ability to perceive emotion unless affected by an organic dementing process. These results should however be interpreted cautiously as the study used a small number of subjects and cartoon drawings of faces rather than posed faces. Further studies with elderly subjects (both dementing and non-dementing) are required to further validate the findings of this study.

1-4-3 Intellectual Functioning/ Cortical Damage

A number of studies have examined the relationship between intellectual functioning and the ability to recognize emotion in facial expression. Early studies found that a positive relationship exists between intelligence and the ability to judge others (Gates, 1923; 1927). Allport (1937) argued that understanding people is largely a matter of intelligence, that is, perceiving relationships between expressive behaviour and inner traits. Recently this argument has been tested.

Rothenberg (1970) studied the ability of 108 children (aged seven years six months to nine years six months) to select an emotion (happiness, anger, sadness or distess/ anxiety) which were each central themes of a particular story. The subjects were administered the Peabody Picture Vocabulary Test (PPVT) and the Block Design Subtest of the Weschler Intelligence Scale for Children (WISC) as respective measures of verbal and performance IQs. Rothenberg found a positive relationship between intelligence and ability to accurately identify the emotion central to each story (this ability was labelled 'social sensitivity'). For third graders the greatest correlation was between nonverbal IQ and social sensitivity ($0.317, p<0.05$) whereas for fifthgraders the highest correlations was between verbal IQ and social sensitivity ($0.275, p < 0.01$).

Using emotional stimulus from Ekman (1976), Zabel (1979) tested 91 children (aged between seven years five months and fourteen years three months) on an emotion recognition task. No significant correlation was found between overall

emotion recogntion scores and Peabody Picture Vocabulary Test scores nor between recognition of each individual emotion and PPVT scores.

Walker, McGuire & Bettes (1984) used the Shipley Scale (a measure of verbal information and comprehension) as an indication of intelligence for 96 schizophrenic and 100 affective disordered patients. They found no relationship between patients IQ's and performance on three emotion tasks involving simple facial discrimination, emotion discrimination and emotion labelling. They suggest these results are consistent with the assumption that certain social-cognitive abilities are independent of general intelligence.

While these studies tend to confirm that recognition ability is not related to IQ, Field & Walden (1982), studying both the production and discrimination of facial expression in preschoolers found that IQ scores were related to the ability to express emotions. They provide no information on how IQ scores were obtained.

Several studies have focused specifically on the ability of individuals with low IQs to recognise emotion. Levy, Orr & Rosenzweig (1960) studied 66 mentally retarded male subjects aged between fifteen and thirty one years. IQs ranged from 50 to 79 (mean = 62) as measured by one of four intelligence tests (Stanford-Binet, Weschler-Bellvue, WAIS or WISC). These subjects were asked to rate forty eight photographs of a young woman in terms of pleasantness-unpleasantness using a nine point scale. Results indicated that the performance of mentally retarded subjects correlated closely to those of fifty male mental hospital

patients (diagnosed schizophrenic or as having other "fairly severe pathologies") and normal subjects from an earlier study (Engen, Levy & Schlosberg, 1958). The two clinical groups however had a greater range of scores suggesting that pathology, rather than having a leveling effect, may act to accentuate individual differences in social perception. No data was provided on differentiation of dimensions other than pleasantness-unpleasantness or on the pattern of confusion between various emotions.

In a more recent study, Gray, Frazer & Leudar (1983) tested twenty six young mentally retarded adults in a judgement study using stimulus material from Ekman & Friesen (1976). Thirteen of the subjects were classified as mildly retarded (IQ range 55-87) and thirteen as severely retarded (IQ range 41-53). They found that overall performance was correlated with intelligence, the severe group making more mistakes than the mild group and both performing less well than norms for normal subjects. Their conclusion, is however based on performance differences between the two groups and does not take into account other factors the groups may differ on, for example, length of time spent in institutions.

Several studies have been concerned with the effect of brain damage on the ability to recognize emotion in facial expression. DeKovsky, Heilman, Bowers & Valenstein (1980) presented nine patients with right hemisphere disease (RHD), nine with left hemisphere disease (LHD) and nine controls with six picture tests comprising either emotional faces or emotional scenes. Their task was either to denote (name or choose) an emotion or discriminate (same,

different) between two faces on the basis of emotion shown. They found that patients with RHD performed significantly worse than subjects with LHD when asked to discriminate between faces, to discriminate between emotional faces and to name emotional scenes. There was also a tendency for RHD subjects to be more impaired than LHD subjects when naming or choosing an emotional face.

Other studies have comfirmed that the right hemisphere is superior to the left hemisphere in the processing of faces and emotional expressions and that damage to this region leads to greater impairment of this ability (Rinn, 1984; Etcoff, 1984). Etcoff (1984) further found that right hemisphere damaged patients performed comparative to controls in their rating of emotional words suggesting that their ability to conceptualize emotional states was intact and that their impairment was limited strictly to the perception of emotion.

Prigatano & Pribraum (1982) asked brain damaged patients and controls to identify the facial emotion in a series of photographs. They found that greater misperception of facial affect was associated with posterior lesions when bilateral lesions were removed from data analysis.

Taken together these studies suggest that the ability to recognise emotion in facial expression is independent of general intelligence but that impairment in such an ability may be evident in intellectually handicapped populations and in individuals with damaged right cortical hemispheres.

1-4-4 Psychiatric Disorders

The study by Levy et al (1960) discussed above compared psychiatric patients with controls in their ability to

recognize emotion in facial expression. Several studies have confirmed that schizophrenic subjects show a deficit in the ability to recognize facial affect (Dougherty, Bartlett & Izard, 1974; Muzekari & Bates, 1977; Walker, Marwitt & Emory, 1980; Walker, 1981). Cutting (1981) found such a deficit in acute but not chronic schizophrenics.

Zabel (1979) compared the abilities of emotionally disturbed and non-disturbed children. The disturbed group comprised of pupils from a special school whose emotional and behavioural problems were too severe to be accommadated in in regular schools. The emotionally disturbed children were found to be significantly less proficient for overall emotional recognition and for several individual emotions (sadness, fear and disgust).

Several studies have compared the recognition abilities of differentially diagnosed psychiatric patients. Walker (1981) for instance, found that schizophrenic children were less accurate than those labelled anxious-depressed or unsocialized-aggressive or normal. Anxious- depressed children fell between schizophrenics and normals in their affect recognition ability while the unsocialized-aggressive group did not differ from normals.

Walker, McGuire & Bettes (1984) compared the performance of adult schizophrenics and patients with affective disorders on four tasks: facial discrimination, emotion discrimination, emotion labelling and a multiple choice emotion task. The performance of affective disordered patients fell midway between that of schizophrenics and normals on all the tasks. Schizophrenics performed significantly below normals on all but the facial

discrimination tasks (contrary to Novic, Luchins & Perline, 1984). Thus deficits were only manifested on tasks that required the subject to make a judgement regarding the emotional qualities of the facial configuration. These results suggest that the deficit is at the level of extracting affective connotation from facial cues rather than solely a function of the labelling requirements of the task.

Novics, Luchins & Perline (1984) also found that compared to controls, chronic schizophrenics tended to perform more poorly on a test of facial affect recognition but when simple facial recognition (matching a target face up with three pictures of the same person presented in a six stimulus array of faces) was entered as a covariate the difference was eliminated.

From these studies it appears that individuals who suffer from both schizophrenia and affective disorder may show deficits in the ability to recognize emotion in facial expression, however the mechanisms involved in these cases may differ. In individuals with schizophrenia, it seems the deficit is at a perceptual level rather than due todifficulties labelling emotion. In individuals with affective disorder, it is interesting to speculate how their prevailing mood might influence their judgement of emotion in others. This is further discussed in secion 1-4-6.

1-4-5 Abused Children

Several recent studies have focused on the social competency of victims of child abuse. Abused children have been found to be more aggressive, less mature, less self

confident, less responsive to positive approaches by peers and less responsive to adult modelling than non abused children (Barahal, Waterman, & Martin, 1981).

Barahal, Waterman & Martin (1981) found that compared to non-abused children they were less able to identify appropriate feelings and pick up affective changes in context from emotionally laden audio-taped stimuli. Camras, Grow & Ribordy (1983) compared seventeen abused and seventeen matched non-abused children on their ability to identify Ekman & Friesen's (1976) six facial expressions of emotions. They found that abused children were less skilled in decoding facial expressions of emotions. These studies suggest that the social difficulties which abused children experience may be due in part to inaccurate perceptions of others emotions.

These results have particular relevance to the current study in that recent research (Alfaro, 1981; Kratcoski, 1982; Mouzakitas, 1981) have pointed to a relationship between family violence, especially abuse, and later delinquent and criminal behaviour. Lewis, Pincus, Lovely, Spitzer & May (1987), comparing matched samples of controls and incarcerated delinquents found that the delinquents were significantly more likely to have experienced severe physical abuse than were their non- delinquent counterparts.

1-4-6 Decoders Emotional State

Schiffenhauer (1974) manipulated the mood of his subjects by playing audio-tapes designed to elicit happy or disgusted feelings. He found that the subjects own emotional state influenced his/her judgement of others

emotional states. An aroused subject was more likely to attribute the emotion s/he was feeling and other similarly valenced emotions than was a non-aroused or differently aroused subject. Further the subjects own emotional state had an influence on the intenstity of the emotion attributed to the slides.

Gard, Gard, Dossett & Turone (1982) administered the Manifest Anxiety Scale (a self report questionaire which purports to differentiate highly trait-anxious individuals from those lower in anxiety) before they viewed Ekman & Friesen's (1976) slides of facial affect. Subjects were tested in normal and then stress-inducing situations. Analysis of the data indicated that lower trait- anxious subjects were more accurate in interpreting facial expressions in stressful situations whereas high trait-anxious subjects were superior in non-stressful situations but showed significant deterioration in accuracy when subjected to situational stress. This indicates that highly anxious individuals tend to be very responsive to social cues but that this responsiveness declines in times of increased stress. It could be that there is an optimum level of anxiety at which social perception ability is ennhanced.

Carlson, Felleman & Masters (1983) induced one of four affective states (happiness, anger, sadness or a neutral state) in eighty subjects aged 4-5 before they viewed slides of facial affect. Sad emotional states promoted systematic inaccuracies in the perception of sadness causing the children to mislabel sadness as anger. Anger was judged with systematic inaccuracy by all subjects

regardless of their own emotional states. In sum though the childrens own emotional state did not affect their overall accuracy or the rated intensities of the states they judged. In contrast to Schiffenhauer they conclude that childrens emotional states do not have a powerful or particularly broad influence on the accuracy of thei social perceptions.

Carlson, Gantz & Masters (1983) further addressed the degree to which adults emotional states influence their perception of emotional states in children. Adults emotional states were found to have little impact on their accurate recognition of childrens emotions but did influence the intensity they assigned to such emotions.

It seems then, from these few studies that observers own emotions may influence their perceptions of emotions in others, if not in terms of outright recognition then at least in terms of the perceived intensity of the emotions. Further research is required to validate these initial studies.

1-4-7 Sociometric Status

Sociometric status (SMS) is determined by a variety of means but generally involves peer ratings of popular and unpopular class members. Subjects (most commonly school children) are then ranked in terms of popularity (from popular or accepted to unpopular or rejected). Findings indicate that there are striking individual differences in the extent to which individuals are accepted by their peers. Early studies examined the relationship between popularity and social skill. Gottman, Gonso & Raussmussen (1975) for instance, found that popular children are more

socially skillful than unpopular children and interact differently with their peers.

A natural extension of these findings is to enquire whether the ability to perceive emotion (as a facet of social skill) varies with SMS. Feild & Walden (1982) asked 34 children aged 3 to 5 years to rate their classmates on whether they would like to play with that child "a whole lot" , "a little" or "not at all". They found that the ability to produce accurate facial expressions of emotions correlated with SMS.

Edwards, Manstead & MacDonald (1984) asked 196 school children between eight and eleven years to indicate how friendly they were with each classmate on a five point scale. They then selected two boys and two girls from each of six classes attracting the highest and lowest scores and showed them slides from Ekman & Friesen (1975). Their results indicated a significant main effect between recogntion accuracy and SMS. High SMS children made more correct identifications than low SMS children. It is unclear from this study whether the superior emotion recognition ability of high SMS children resulted from more extensive social experiences or whether these children were popular with their peers because of their superior emotion recognition ability. It is also possible that the high SMS children had higher verbal intelligence scores and were thus advantaged on a test requiring knowledge of emotional terms.

A similar procedure was used by Vosk, Forehand & Figueroa (1984) to rate the sociometric status of 160 third, forth and fifth graders. These scores were used to

make an 'accepted' group (peer rating score > 3.91, positive sociometric score > 0.24 negative sociometric score <0.06) and a 'rejected' group (peer rating score < 3.17 , positive sociometric score < 0.06 , negative sociometric score > 0.24) who were then tested on a recognition task which involved videotaped interactions conveying happiness, anger and sadness. They found that accepted children correctly identified emotions more often than rejected children. Subjects were also tested on the Vocabulary Subtest of the Weschler Intelligence Scale for Children - Revised (WISC-R). Accepted and rejected children were found to differ significantly on this score [t(38)=3.02 , p< 0.01] but the correlation between accurate responses to the videotaped interactions and accurate responses to the Vocabulary test was not significant (r= 0.14) suggesting that verbal IQ does not influence recognition abilities.

These three studies provide confirmation of the relationship between SMS and ability to perceive emotion: those who are rated as more accepted by their peers are more accurate at judging emotion. These findings have major implications for adult studies. If low accepted children experience limited opportunities for peer interaction it is likely they would be relatively deprived of opportunities to to learn normal adaptive modes of social conduct and social cognition. They may be thus more vulnerable to later adult maladaptive functioning. This is of relevance to the current study in that children who rate low in terms of SMS may also be those individuals who receive prison sentences in later life.

In a major review on the topic, Parker & Asher (1987) evaluated the empirical support for the premise that poorly accepted children stand a greater chance than others of developing later life difficulties. Reviewing fifty four studies examining the relationship between low peer acceptance in childhood and later juvenile and adult offending they make the following conclusions. They suggest that available followback evidence supports the view that offending adolescents and young adults are often individuals with a history of pervasive and persistent peer rejection. Further, they found that several follow-up analyses linked poor peer acceptance to later juvenile or adult criminality in a predictive sense. They conclude from these findings that the evidence for a link between early peer-relationships disturbance and later adult criminality is generally very good.

1-4-8 Conclusions.

In sum these studies suggest that several characteristics of subjects may influence their ability to recognise emotion in facial expression. It seems that females may have a small advantage over males in this respect, but that ignoring the changes in childhood development, and in the effects of dementia age has little effect on recognition ability. Low sociometric status, intellectual impairment and brain damage, evidence of psychiatric or emotional disturbance, a history of physical abuse and emotional state at time of testing have all been found to impair recognition of facial expression to varying degrees. The following section will discuss studies which have examined the general social skill abilities of

prisoners and those few studies which have focused on the cognitive abilities related to social skills in prisoners.

1-5 CHAPTER FIVE: SOCIAL PERCEPTION AND SOCIAL SKILL IN PRISONERS.

Brown (1980) has noted that psychologists approaches to criminality have altered in recent years. The medical 'disease' model, which held that criminals were sick and that criminal behaviour was qualitatively different from normal behaviour (Menninger, 1968), gave way to various personality theories where deviancy, including criminal behaviour, was generally conceptualized as the result of inappropriate personality development or excessive loadings on certain personality dimensions. Popular psychological input within prisons included psychometric testing, individual and group psychotherapy. More recently, without completely abandoning the personality approach more interest has focused on measurement and modification of specific skills, the lack of which increase the liklihood of offending or make it more difficult to lead an adaptive lifestyle.

Brown (1980) points out that often prison is the "final and irrevocable" step along a career of deviance and studies point to the fact that some individuals are more at risk of being imprisoned than others. Such studies have identified pathogenic family patterns as important aetiological factors in the progression through delinquency and criminal behaviour (Cloninger and Guze, 1970; McCord and McCord, 1959; Scharfman and Clark, 1967). Broken homes, parental rejection, sociopathic parental models and limited interaction with peers are all conditions which reduce the individuals opportunities for developing skills and behaviours necessary for successful adjustment in the

community.

Other studies have examined the extent of social skills in prison populations. Toch (1972) argues that most violent-prone individuals can be classed as deficient in verbal and social skills and that this lack of social skills not only produces violence as a substitute for talk but may also provoke violent outbursts towards the individual by people who are unable to reach him/her in more conventional ways.

Rehabilitation programmes in prisons have been concerned with the development of academic and occupational skills (Tannenbaumer and Fishbein, 1978), assertiveness (Kirchner, Kennedy and Draguns, 1979; Gilmour, McCormick and DeRuitter, 1981) and interpersonal skills (Bornstein, et al. 1979). These studies have all adopted the premise that those who come into contact with the law must be deficient in appropriate interpersonal skills. Several studies support this premise (Kirchner, Kennedy and Draguns, 1979; Bornstein et al, 1979). A similar rationale underlies the use of social skills training with delinquent populations (Sarason, 1968; Spence and Marzillier, 1979; Ollendick and Hersen, 1979). Despite the arguement that the interpersonal skills repertoire of incarcerated individuals may be be limited few studies report on remediation attempts.

1-5-1 Social Perception Abilities in Prisoners.

Fewer studies still have reported on the social perception abilities of prisoners. The literature on this topic is patchy and conclusions are often reliant on inferences made from studies on non-incarcerated populations, adolescent offenders and specific crime

offenders. A number of studies, for instance, have found that non-imprisoned individuals who act in destructive or illegal ways are often lacking in empathic skills (Chandler, Greenspan and Barenboim, 1974; Kurtiness and Hogan, 1973) and fail to be fully aware of the intentions of others (Hudgins and Prentice, 1973). Several studies have found that feedback from a victim affects the behaviour of an aggressor. A victims pain and emotion will interact with situational factors to either increase or decrease the the intensity of an aggressors attack (Savitsky, Izard, Kotsch and Christy, 1974; Savitsky, Czyzewski, Dubord and Kaminsky, 1976; Savitsky and Sim, 1974). These studies indicate that on a general level prisoners may have deficits in social perceptual abiliies. One further study has compared offenders and non-offenders ability to recognise emotion in facial expression while others have examined such abilities in individuals who commit particular types of crimes (eg victim oriented, sexual). These will now be discussed.

1-5-1-1 Studies with facial expressions: Savitsky and Czyzeski (1978) studied the reaction of adolescent offenders and non-offenders to non-verbal displays of emotion. Subjects were required to label video-taped subjects as showing one of interest, joy, sadness, distress, disgust, anger, shame, fear or neutral. Observers had previously labelled the taped emotions with reliabilities of more than 88%. Scores for subjects were derived by comparing their responses to those of the standardization raters. Analysis of the scores indicated that deliquents were less accurate than non-delinquents

when measured against norms set by adult raters [$t(54)=2.46$, $p<0.02$, $M=22.97$, $SD=2.65$ for non-delinquents, $M=20.14$, $SD=5.79$ for delinquents, possible range of scores: 0-32]. However, further analysis indicated that verbal intelligence plays a role in this apparent deficit. When disparities in verbal abilities between the groups were statistically removed, the difference in emotional labelling ability became insignificant.

1-5-1-2 Recognition accuracy and its relationship to crime committed: Eby (1981) hypothesized that: 1) adolescent offenders with a history of offences directed towards a physically present victim and 2) adolescent offenders who obtained high scores on a personality inventory assessing psychopathic characteristics would a) attend less to the visual cues of emotion displayed by others , b) attend less to the vocal cues of emotion displayed by others , c) exhibit a lowered preference for affective information as a solution strategy in a problem solving situation and d) be less accurate in classifying the emotion displays exhibited by others, relative to adolescent offenders with no arrest histories of victim-directed offences and adolescent offenders with lower scores on the personality inventory.

Significant differences were found in the hypothesized direction between adolescent offenders scoring high and low on the personality maesure of psychopathy in terms of three of the four emotion awareness variables (attention to visual cues of emotion, attention to vocal cues of emotion and preference for affective cues). These difference were found to be independent of age, verbal intelligence and

race. Contrary to the hypothesis, however, no significant differences were found on any of the emotion awareness variables with respect to the nature of the subjects criminal offences.

Borden (1985) explored the relationship between the type of offence committed and the offenders perception of others. He hypothesized that incarcerated male offenders who are 'personal offenders' will have a lower 'others-concept' (a person's general expectancies or perceptions about others) than those who are either victimless or property offenders but actually found no significant differences between these groups.

Related to these findings but not concerning incarcerated individuals, Smith (1975) tested the notion that individuals diagosed as anti-social personality disordered are highly exploitative people who are adept at "sizeing people up" and hence more accurate at person perception than normal people. Contrary to this hypothesis the study found that antisocial male prisoners were not accurate than normal males, scoring the same as controls on some measures and significantly worse than controls on others. Smith does not provide details of the methodology used.

Rape has been hypothesized to relate to a variety of aetiological factors including deficiencies in inter-personal social skills (Abel, Becker, Blanchard and Djenderedjian, 1978; Laws and Serber, 1975). Behavioural theorists (eg Abel, Becker, Blanchard and Djenderedjian, 1978; Barbaree, Marshall and Lanthier, 1979) maintain that skills deficits, such as an inability to initiate and

maintain inimate relationships, a lack of knowledge of appropriate social behaviours and an inability to control anger and hostility, play a major role in predisposing an individual to committing sexual assaults.

Stermac and Quincey (1986) assessed the heterosocial competence of a group of incarcerated sexual assaulters. Subjects performance on a number of role play situation was rated and they completed a number of questionaires focusing on social anxiety, assertiveness and attitudes towards women. The study did not find a social deficit unique to rapists. Rapists differed from non-psychiatric, non-criminal subjects on overall social competence but did not differ from other incarcerated offenders. In a test of social perception subjects were required to identify the social stimulus involved in a video-taped conversation by indicating what sort of behaviour was being shown (rude and hostile; cold and rejecting; neutral; warm and accepting; sexually provocative). Results indicated that rapists indentified the behaviour of others realistically.

Giannini and Fellows (1986) tested the interpretation of non-verbal cues in rapists. Subjects were twelve white, middle class, college educated, self reported rapists who were without arrest histories and who volunteered for the study. The study utilized videotapes from previous studies consisting of 'senders' engaging in trials with an opportunity to win variable jackpots (penny, quarter or dollar) while gambling with a slot machine. Rapists and control subjects were asked to view the tapes of senders faces and on the basis of transmitted facial expressions, determine the amount of money at risk. The results

indicated that rapists scored more correct responses than non-rapists when viewing male or female senders, supporting a hypothesis that at least some male rapists possess an enhanced ability to read non-verbal facial cues. These rsults must however be interpreted with caution due to the rapists inthis study being a highly selective group who may not be representative of other sexual offenders.

Taken together thes studies suggest that individuals incarcerated for crimes of violence may show deficits in the ability to recognize emotion in facial expression. Concerning such abilities in sexual offenders the results are more conflicting allowing few conclusions to be made. Such findings do however illustate the need for a careful study of recognition abilities in prisoners incarcerated for different offenses using an established methodology.

1-5-2 Rationale For The Current Study.

Over one hundred years of research has confirmed Darwin's original proposition that recognition of emotion is a universal phenomenon. Subsequent research has found that the ability to recognise emotion begins developing in the individual soon after birth and continues to develop throughout childhood. By early adulthood individuals have the ability to recognise distinct emotions with a high degree of accuracy.

The findings of universality and developmental studies have provided a baseline from which recent work has been launched. Stimulus material developed by Ekman & Friesen (1976) has allowed judgement studies to procede without the limitations of earlier studies. Studies of children have shown that while development of recognition skills

progresses throughout childhood, events in childhood such as abuse from others (Barahal, Waterman & Masters, 1981), low ranking of acceptability by peers (Edwards, Manstead & MacDonald, 1984) and incidence of psychiatric disorder (Walker, 1981) and emotional disturbance (Zabel, 1979) can retard such development. It is unclear whether such disadvantages in recognition skills persist into adulthood but if they do it is likely that the subjects of the present study (male prisoners) should exhibit a similar deficit in emotional recognition (Parker & Asher, 1987).

Recent research has found that even normal adults make common confusions between some emotions. It has been suggested that these should be considered as errors but as an indication that emotional categories are sets with fuzzy boundaries. Most recently research has turned to the assessment of emotional recognition ability in specific populations.

It has been found that females may be more accurate at recognising emotion than males (Hall, 1978) but that aging has little effect on recogntion ability exept where a dementing process may interfer (Brosgole, Kurucz, PlaHovinsak, Boettcher, Sprotte, & Haveliwala, 1983). Similarly there is little variation on recogntion ability with general intelligence, unless the individual is intellectually handicapped (Gray, Frazer, & Leudar, 1983) or has suffered brain lesions, particularly to the right hemishere (Etcoff, 1984). Recognition ability has been found to vary with sociometric status (Edwards, Manstead, & MacDonald, 1984; Vosk, Forehand & Figueroa, 1984), those rated as having low SMS also having decreased recognition

abilities. Incidence of schizophrenia and affective disorder has been shown to decrease recognition abilities in individuals (Walker, McGuire & Bettes, 1984).

Prison workers have recently shown a concern for the social perception abilities and social skills of prison populations (Brown, 1980). Given that low SMS children consistently show deficits in facial recognition ability and given that there is strong evidence for a link between early peer-relationship disturbanceand later criminality it follows that deficits in facial expression recognition should be evident in adult prisoners. The existing small literature concerning this has not provided such clear evidence. Rather, findings have been inconclusive and contradictory. A number of factors may account for this. None of the literature reviewed has taken advantage of the considerable methodological and conceptual developments which have taken place in the emotional recognition field. None, for instance, have utilized Ekman & Friesen's (1976) stimuli, and the wide range of methodologies used makes comparisons between studies tenuous. Further, many studies have been limited to adolescent offenders (eg Savitsky & Czyzeski, 1978; Eby, 1981), non-imprisoned individuals (eg Chandler, Greenspan & Barenboim, 1974) or to a specific class of offender (eg sex offender: Stermac & Quinsey, 1986). No studies report on the differential abilities of adult incarcerates imprisoned for a variety of crimes and the criteria for classifying offenders has varied considerably between studies further handicapping comparisons.

The current study examines the ability of male prisoners

to recognise emotion in facial expression. In doing so a number of short-comings of earlier research are combated. The current study uses validated stimulus material (Ekman & Friesen, 1976) in a manner that has been used repeatedly in earlier judgement studies. The current study compares the ability of prisoners incarcerated for a variety of offences.

Specifically it is hypothesised that prisoners incarcerated for crimes against the person (sexual and violent) will be less accurate at recognising emotion in facial expression than those incarcerated for dishonesty crimes and anti-social acts. The following section describes the current study in detail. The aim is to determine if a defict in emotion recognition ability is a contributing factor in the types of crime an individual is likely to commit.

PART TWO

CURRENT STUDY

2-1 INTRODUCTION

Past studies have provided conflicting results regarding the social perceptive abilities of prisoners. Studies have used a diverse range of methodologies, not always taking into account the ability to recognise emotion in facial expression. Research has often been restricted to adolescent offenders or to individuals incarcerated for a particular offense.

The current study uses an established and validated methodology to test the ability of prisoners to recognise emotion in facial expression. It aims to determine: 1) if prisoners differ from normal adults in their ability to perceive emotion and 2) if prisoners incarcerated for different offences differ in their ability to recognize emotion.

2-2 METHOD

2-2-1 Subjects

Subjects for the study were seventy-six adult males serving sentences at Paparua Prison, Christchurch, New Zealand. Paparua Prison is a medium security male prison with a catchment area covering the top half of the South Island and an approximate muster of 290. Recent overcrowding in North Island prisons has ment that some North Island offenders have been sent south to Paparua thus effectively extending its catchment and muster size. A pool of prospective subjects were selected by staff of the Justice Departments Psychological Centre to cover a wide range of criminal offences. The experimenter was blind at the time of testing to the criminal history and the offence resulting in the current incarceration of subjects.

2-2-2 Experimenter

All testing was conducted by the author a twenty five year old male post-graduate psychology student. The experimenter was introduced to subjects by prison staff as a psychologist.

2-2-3 Setting

All testing was conducted in one of two rooms (depending on availability), the Psychologist's Office or a group room in the administration block of Paparua Prison. The rooms were similar in size. Apparatus used was set out in an identical pattern in each room. All testing was conducted between 8.15 am and 4.00 pm, times which best suited prison routine.

2-2-4 Apparatus/Materials

Thirty six photographs from Ekman and Friesen's 1976 series were selected as stimulus material for the judgement study. Six slides represented each of the following emotions: surprise, fear, disgust, anger, happiness and sadness. Where possible an equal number of male and female posers were selected for each emotion and as many different models included as possible (see Appendix A for photographs).

These photographs were converted to slides for presentation. A Kodak Carousel Projector (S-AV 200) was used to project the slides onto a screen 2.40 metres away producing an image 0.90 x 1.20 metres. The projector was connected with an electronic shutter (Ilex No 1 Synchro-electronic shutter) and shutter control (Cavette Instrument Co.) to enable each slide to be shown for a brief duration (0.5 seconds) so as to approximate actual

viewing of emotion. The shutter control and projector remote control were operated by the experimenter from a seat in front of the projector. The subject sat along side the experimenter 2.00 metres from the screen. The Weschler Adult Intelligence Scale (WAIS) (Weschler, 1955) was used to determine the IQ of each subject.

2-2-5 Procedure

Prospective subjects were summonsed individually from prison wings or work places by prison officers who told them a psychologist wanted to see them. A number refused to accompany the officer and hence were excluded from the study. Once subjects arrived at the testing room the procedure was briefly explained to them. It was stressed that their participation was optional, that any results were confidential and would not be available to prison authorities nor placed on their prison file and that their participation would count neither for nor against early release prospects. Some prospective subjects declined to partake in the study at this stage. Refusals were subsequently replaced by other subjects from the provided pool.

Each subject was tested individually following the selection process described above. Following agreeing to take part in the study it was further explained to each subject that they would be participating in a "survey", along with a large number of other prisoners, that required them to rate a series of slides. Prior to viewing the slides each subject was given a short questionaire (see Appendix B) to obtain demographic information not included on Justice Department files. Additional , detailed

information regarding each subjects offence history was later obtained from Justice Department records.

Prior to each session the slides were arranged in the projector carousel in a randomized order as determined by a random number generating computer programme. It was explained to each subject that that he would be viewing a series of slides showing peoples faces which would flash on the screen for a brief period and that they would be required to respond "yes" or "no" to a checklist of emotions depending on whether they believed an emotion was present in the presented face or not.

The following explanation was provided to each subject: "You may feel that each face shows more than one emotion, you may therefore respond "yes" to more than one emotional category. You may feel that none of the emotions I read accurately describe what you see in which case you may respond "no" to all of them. There are no right or wrong answers, it is your impressions which are important".

Subjects were then shown two test slides (also from Ekman and Friesen, 1976) to ensure they understood the procedure and emotional categories used. Data was not recorded for these slides. Subjects who responded to the test slides with other than a "yes" or "no" were requested to make a choice. Subjects who responded to slides with their own emotional terms not included in the list were requested only to respond to the list given. If subjects appeared not to understand the emotional labels used when shown the test slides a set of short illustrative stories was provided to describe the use of the words (see Appendix C). After viewing the test slides subjects went on to view

the thirty six experimental slides.

Following each slide presentation the experimenter asked the subject if the slide showed each of the six emotions in the following fashion:

"Did that face show anger?..., happiness?..., fear?..., surprise?..., disgust?..., sadness?..."

requiring the subject to answer only "yes" or "no". Thus each slide was probed for both the target emotion and the five non-target emotions. The order in which the emotions were probed was randomized (again by computer) and listed on a score sheet on which the experimenter marked the subjects response. One of four score sheets was used for each subject. Each of these four sheets differed only in the order in which emotions were randomly presented (see Appendix D).

Finally each subject was tested on four subtests of the Weschler Adult Intelligence Scale (WAIS): Information, Vocabulary, Block Design and Picture Arrangement, providing measures of verbal, performance and full-scale IQ. Maxwell (1957) found that this combination of subtests correlated most highly with full-scale IQ compared to other combinations of four subtests. Matarazzo (1972) found that various tetrads correlated between 0.953 and 0.942 with full-scale IQ.

2-3 CLASSIFICATION OF PRISONERS

Following the completion of all testing information on each subjects full criminal history was obtained from Justice Department computer files. The experimenter analysed each file and tallied the total number of convictions for each offence for all subjects. A checklist of seventy nine

offences was thus developed into which all offences by all subjects could be placed. These seventy nine offences were all defined by the four digit (specific) code of the Police Offence Code.

A brief description of the Police Offence Code is necessary. The code is used by police entering information into a computer to describe all police jobs, incidents, tasks and offences. It consists of a simple logical series of numbers each uniquely identifiable. Offence codes incorporate all offences dealt with by the police. Each code is divided into four levels. The first corresponds to the "group" of crimes under which an offence is listed (eg 4(121) = group: "dishonesty"). The second level corresponds to the "class" of offence (eg 41(21) + class: "burglary etc"). The third corresponds to the "type" of offence (eg 412(1) = type: "burglary - other property"). The forth level describes the "specific" offence (eg 4121 = specific: "burgles other property - estimated value over $1000 - day ").

The Police Offence Code consists of eight groups of offences: 1000, Violence; 2000, Sexual; 3000, Drugs and Antisocial; 4000, Dishonesty; 5000, Property Damage; 6000, Property Abuse; 7000, Administrative/Against Justice; and 8000, Traffic. Thus for each subject a criminal profile was developed consisting of their score on a checklist of 76 offences. These profiles were subsequently submitted to statistical analysis (cluster analysis) to determine the experimental groups for the current study. The results of these analyses will be discussed in the next section.

PART THREE

RESULTS

3-1 DEMOGRAPHIC DATA

There were 76 subjects finally involved in this study. They ranged in age from 18 years, 6 months to 67 years, 8 months with a mean age of 28 years, 5 months (sd = 8 years, 3 months). Forty nine (64.5 %) were Caucasian, twenty three (30.3 %) were Maori, three (3.9 %) were of Pacific Island decent and one (1.3 %) was of other ethnic origin (Indian).

Subjects had spent an average 26 months (sd = 27.71 months) total time incarcerated, including time in borstal and corrective training. They had spent an average 6.87 months (sd = 9.2 months) of their current sentence in prison. Twenty one subjects (27.63 %) had not been imprisoned prior to their current term.

Eight potential subjects refused to accompany the officer, or were unavailable when requested and hence were excluded from the study. Three prospective subjects declined to be involved after the study was explained. No details on the demographic data or offence histories of these subjects is available. Refusals were subsequently replaced by other subjects from the provided pool. All subjects who participated in the study were cooperative and most were highly motivated, finding the procedure interesting and a novel change from prison routine.

3-2 CLASSIFICATION OF PRISONERS

The offence profiles of all subjects were cluster analyzed (BMDP, Dixon, 1981) to determine the experimental groups for this study. Analysis failed to produce meaningful clusters of subjects in terms of similar offence histories. This was possibly due to the highly complex nature of the profiles and that many profiles consisted of

zero scores (ie no offence committed) in all but a few of the offence cells (thus the analysis determined that two subjects had similar profiles on the basis of their mutually high number of zero scores whereas the crimes that they had committed were quite different).

To reduce the number of zero scores and thus the complexity of the array, summary scores for each of the eight groups of specific offences listed in the Police Offence Code were tallied for each subject. These scores thus provided each subject with an eight score offence profile (instead of 79). These were then analysed. Again no meaningful clusters of offenders emerged in terms of similar offence histories.

Due to the unsuccessful attempts to statisically group subjects, an alternative procedure was instigated. The experimenter examined the profiles of each subject in terms of the 79 specific offences and assigned subjects to one of eight groups. These groups were defined by the first digit of the Police Offence Code and thus consisted of 1) violent offences, 2) sexual offences, 3) anti-social & drug offences, 4) dishonesty offences, 5) property damage offences, 6), property abuse offences, 7) crimes against justice and 8) traffic offences. Subjects were classified according to which of the above groups his most numerous or most serious offences lay. Using this criterion four groups of offenders emerged.

Twenty one of the subjects were considered to have committed predominantly crimes of violence, a further twenty one committed predominantly sexual offences, nine subjects were classified as predominantly committing crimes

involving drugs and antisocial acts while twenty four were considered to have committed predominantly crimes of dishonesty. These four groups were used for subseqeuent analysis of accuracy of recognition. One subject was considered to have committed predominantly traffic offences and was removed from the study. No subjects were considered to have committed predominantly crimes of property damage, property abuse or administrative/against justice.

Reliability for the above classification was obtained by independent classification of the the prisoners offences into the eight categories by another psychologist. The two raters agreed on the classification of sixty nine of the seventy six subjects, disagreeing on seven. An inter-rater reliability of 91 % was thus obtained.

3-2-1 Characterisics of group members

Group 1: Violent Offenders

Size: n = 21

Age: mean age = 21.02 years (sd = 3.26 years)

IQ: mean verbal IQ = 95 (sd = 14.5)

mean performance IQ = 105 (sd =11.9)

mean full scale IQ = 99 (sd = 11.5)

Total time incarcerated: mean = 20.4 months (sd = 14.2 months)*

Crimes commonly committed: murder, manslaughter, aggrevated robbery, assault.

Group 2: Sex Offenders

Size: n = 21

Age: mean age = 34.8 years (sd =10.7 years)

IQ mean verbal IQ = 90 (sd = 16.9)

mean performance IQ = 92 (sd = 13.0)

mean full scale IQ = 91 (sd = 13.0)

Total time incarcerated: mean = 33.7 months (sd = 41.1 months) *

Crimes commonly committed: rape, indecent assault, sexual violation, unlawful sexual intercourse, indecencies

Group 3: Antisocial & Drug offenders

Size: n = 9

Age mean age = 32.72 years (sd =6.09 years)

IQ mean verbal IQ = 112 (sd =16)

mean performance IQ = 111 (sd = 16)

mean full scale IQ =112 (sd = 16)

Total time incarcerated: mean = 21.5 months (sd = 20.2 months) *

Crimes commonly committed: behaviour offences, language offences, importing, possessing, selling class A & B drugs

Group 4: Dishonesty Offenders

Size: n = 24

Age: mean age = 25.08 years (sd = 5.01)

IQ mean verbal IQ = 91 (sd = 16)

mean performance IQ = 96 (sd = 14)

mean full scale IQ = 92 (sd = 15)

Total time incarcerated: mean = 27.1 months (sd = 23.6 months)*

Crimes commonly committed: burglary, taking/ conversion, theft, false pretences, receiving/possession of stolen goods.

*These figures include all previous sentences (including Borstal & corrective training) and the duration of the subjects current sentence which had expired at the time of testing.

3-3 ACCURACY OF RECOGNITION

The method by which subjects were tested allowed two independent measures of recognition accuracy to be obtained. One labelled here as "Correct hits" is described by the percentage of occasions that subjects correctly identify an emotion as being present in a slide. It may thus be seen as being a pure measurement of recognition. The second measure has been labelled here "Incorrect hits" because it describes the percentage of non-target emotions the subject responds "yes" to when shown a slide and may thus be seen as a measure of the subjects overal confusion regarding recognition of a particular emotion.

3-3-1 CORRECT HITS

For each subject it was possible to determine how many times he correctly identified an emotion as being present in a slide. Each subject saw six slides of each of six emotions. The number of times (out of six) each subject correctly identified each emotion was converted to a percentage to provide the "correct hit" score.

table 3-1: Anova Summary: Correct Hits

Source	Sum of Squares	d/f	Mean Square	F	Tail Prob.
Group	7756.904	3	2585.635	5.75	0.0007
Emot.	22158.554	5	4431.711	9.90	0.0000
G x E	4705.545	15	313.703	0.70	0.7843
Error	190674.857	426	447.594		

3-3-1-1 Between Groups: Group means for each emotion are presented in table 3-2. These are graphed in figure 3-1. An analysis of variance (BMDP2V, Dixon, 1981) conducted on sujects correct hit scores produced a significant between group effect ($F = 5.75$, $p < 0.0007$) (see table 3-1 for summary of Anova results). These results indicate that Group 1 (violent offenders identified the corrct emotion most often (mean across emotions = 86.49 %). Group four (dishonesty offenders) were next most accurate (mean across emotions =79.91%). Group three (anti-social and drug offenders) were next most accurate (mean across emotions = 77.59 %). Group two (sexual offenders) were least accurate iin identifying the correct emotion as present (mean across emotions = 76.16 %).

table 3-2 Group Means For Each Emotion: Correct Hits								
		Sp	F	D	A	H	Sd	Tot
Gp 1	X	93.57	85.81	81.14	76.66	94.38	87.38	86.49
	sd	10.79	13.39	20.71	19.91	9.12	16.47	6.31
Gp 2	X	81.10	70.10	73.33	68.67	88.86	74.90	76.16
	sd	20.08	23.81	30.10	23.42	25.26	22.54	6.93
Gp 3	X	91.88	62.56	77.11	77.78	91.78	64.44	77.59
	sd	8.43	38.47	18.37	25.25	11.89	26.65	11.58
Gp 4	X	88.21	77.92	78.21	65.54	90.17	79.38	80.30
	sd	13.33	22.47	24.62	31.29	14.48	15.40	8.04
Tot	X	88.69	74.10	77.48	72.16	91.29	76.52	
	sd	4.79	8.67	2.80	5.19	2.06	8.28	

Legend

Sp = Surprise

F = Fear

D = Disgust

A = Anger

H = Happiness

Sd = Sadness

Group 1 = Violent Offenders

Group 2 = Sexual Offenders

Group 3 = Anti-social/Drug

Group 4 = Dishonesty

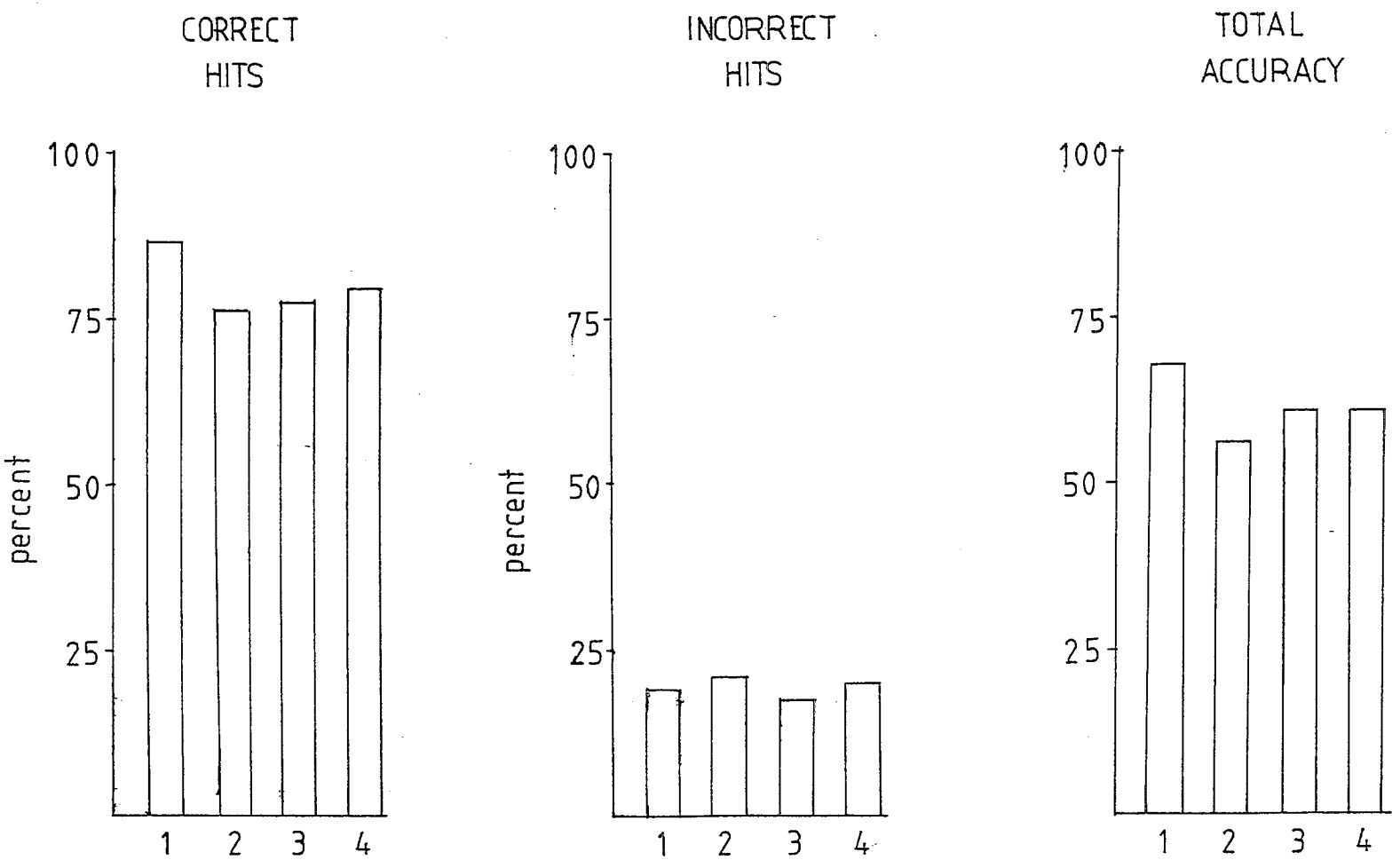

figure 3-1 Correct hits, incorrect hits and total accuracy scores for the four offender groups.

3-3-1-2 Between Emotions: Significant differences were also found between prisoners hit rates of the six different emotions ($F = 9.90$, $p < 0.0001$) (see table 3-1 for summarry of Anova). From table 3-2 and figure 3-2 it can be seen that overall happiness was the emotion most accurately identified by prisoners (mean across groups = 91.29 %). Surprise was the emotion identified second most accurately (mean across groups = 88.69 %), then disgust (mean across groups = 77.48 %), sadness (mean across groups = 76.52 %) and fear (mean across groups = 74.10 %). Anger was the emotion least accurately identified by prisoners (mean across groups = 72.16 %).

3-3-1-3 Group x Emotion Effect: Subjects correct hit scores were also analysed to determine if a group x emotion effect existed. As table 3-1 shows no significant effect was found.

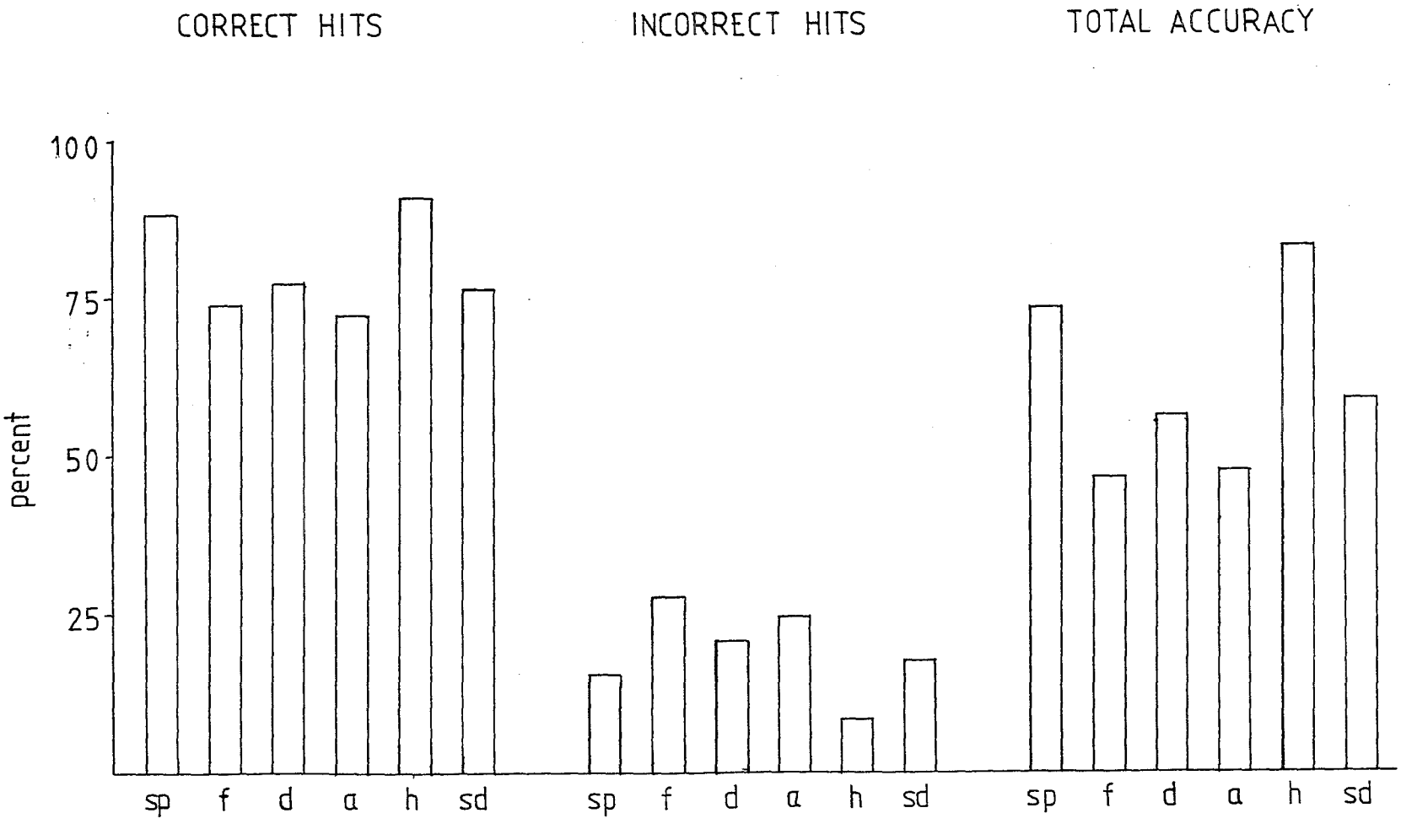

figure 3-2 Correct hits, incorrect hits and total accuracy scores for the six target emotions.

3-3-2 INCORRECT HITS

The second way to examine the subjects recognition accuracy is to examine the "incorrect hits" they made. These are emotions other than the correct one which subjects claimed to see in each slide. For example, shown six slides of a face showing surprise a subject may identify surprise on, say, five occasions (ie correct hit rate = 83.33 %) but for each emotion slide the other five emotions are also probed, providing, for each subject, thirty probe opportunities (five probes x six slides) for incorrect hits for each emotion. Thus if a subject responds to twenty of these probes his incorrect hit rate would be 66.66 %. Note that this score does not account for which specific emotions subjects confuse with the target emotion but rather provides an overall confusion score. The greater the incorrect hit rate the greater a subjects confusion for a particular emotion. Table 3-3 shows the group means for incorrect hit rates when responding to the six emtions.

table 3-3 Group Means For Each Emotion: Incorrect Hits								
		Sp	F	D	A	H	Sd	Tot
Gp 1	X	16.00	32.71	21.29	23.29	5.71	15.05	18.92
	sd	11.06	21.02	12.85	15.34	6.11	14.02	8.15
Gp 2	X	16.90	16.10	21.57	26.24	12.41	19.33	20.43
	sd	15.87	18.42	19.86	18.54	15.92	20.05	4.92
Gp 3	X	13.56	26.00	20.78	20.44	5.11	16.56	17.08
	sd	9.75	7.16	14.75	11.89	5.01	12.63	6.59
Gp 4	X	15.29	26.88	19.41	27.06	8.96	19.88	19.58
	sd	12.89	17.34	15.17	16.39	9.38	16.98	16.34
Tot	X	15.44	27.92	20.76	24.26	8.05	17.71	
	sd	1.22	2.79	0.83	2.62	2.29	1.98	

Legend

Sp = Surprise

F = Fear

D = Disgust

A = Anger

H = Happiness

Sd = Sadness

Group 1 = Violent Offenders

Group 2 = Sexual Offenders

Group 3 = Anti-social/Drug

Group 4 = Dishonesty

table 3-4: Anova Summary: Incorrect Hits					
Source	Sum of Squares	d/f	Mean Square	F	Tail Prob.
Group	448.55	3	149.61	596.42	0.5915
Emot.	15779.29	5	3155.86	0.64	0.0000
G x E	1601.75	15	106.78	0.45	0.9612
Error	100052.42	426	234.86		

3-3-2-1 Between Groups Group differences in incorrect hit rates are illustrated in figure 3-1. These results indicate that Group three (anti-social and drug offenders) were the least confused in their responses (mean across emotions = 17.08 %), that Group one (violent offenders) were next (mean across emotions = 18.92 %), then Group four (dishonesty offenders) (mean across emotions = 19.58 %) while Group two (sexual offenders) were the most confused (mean across emotions = 20.43 %).

Analysis of variance of these figures, however, that differences between groups was not significant (F = 0.64, p = 0.5915) ie groups did not differ in the overall extent to which they confused emotions (see Table 3-4 for Anova summary)

3-3-2-2 Between Emotions Table 3-3 and figure 3-2 indicate considerable variability in the incorrect hit rate of different emotions. Fear was the emotion most often confused (mean across groups = 27.92 %), next often confused was anger (mean across groups = 24.26 %), then disgust (mean across groups = 20.76 %), sadness (mean across groups = 17.71 %), surprise (mean across groups = 15.44 %). Happiness was the least confused (mean across

groups = 8.05 %). Analysis of variance indicates that these differences are significant ($F = 13.44$, $p < 0.0001$) (See table 3-4 for Anova summary).

3-3-2-3 Group x Emotion Effect As table 3-4 shows no group x emotion effect was found to be significant for incorrect hit rates ($F = 0.45$, $p = 0.916$).

3-3-3 COMBINATION OF CORRECT AND INCORRECT HIT RATES

Both of the above measures, correct hits and incorrect hits provide an indication of recognition accuracy and are graphically presented together in figure 3-3. As one is a measure of accuracy and one is a measure of inaccuracy they are presented on the same axis but in opposing directions. A comprehensive score which takes into account correct identification of the appropriate emotion and also the rate with which it is confused with other emotions may be obtained by subtracting the incorrect hit rate from the correct hit rate. These scores are presented in table 3-5 and figure 3-4 for each goup and each emotion and will be referred to as "total accuracy scores".

figure 3-3 Correct hits and incorrect hits from the four offender groups for each of the six target emotions.

table 3-5 Group Means For Each Emotion: Total Accuracy								
		Sp	F	D	A	H	Sd	Tot
Gp 1	X	77.57	53.10	59.86	53.38	88.67	72.33	67.48
	sd	13.47	23.82	22.06	17.76	13.71	24.68	13.15
Gp 2	X	64.19	44.00	51.76	42.43	76.43	55.57	55.73
	sd	28.52	35.17	33.36	26.83	39.68	31.70	11.76
Gp 3	X	78.33	36.56	56.33	51.33	86.67	47.89	59.52
	sd	14.19	36.08	24.46	29.09	14.15	31.27	17.47
Gp 4	X	72.92	51.04	58.79	38.46	81.21	59.50	60.31
	sd	19.49	25.89	28.34	30.36	21.06	21.17	13.92
Tot	X	73.25	46.18	56.69	46.40	83.25	58.82	
	sd	5.63	6.50	3.12	6.16	4.79	8.85	

Legend

Sp = Surprise

F = Fear

D = Disgust

A = Anger

H = Happiness

Sd = Sadness

Group 1 = Violent Offenders

Group 2 = Sexual Offenders

Group 3 = Anti-social/Drug

Group 4 = Dishonesty

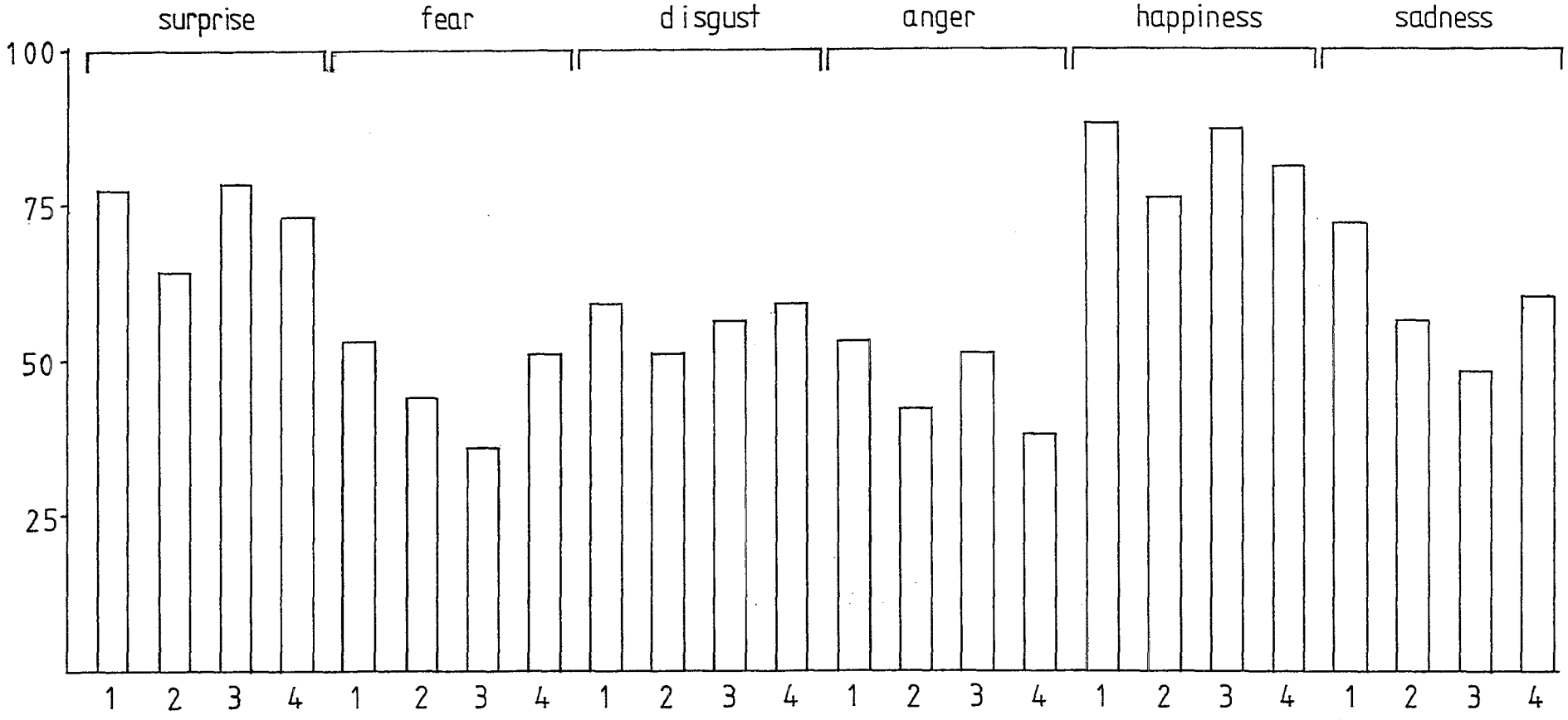

figure 3-4 Total accuracy scores from the four offender groups for each of the six target emotions.

table 3-6: Anova Summary: Total Accuracy					
Source	Sum of Squares	d/f	Mean Square	F	Tail Prob.
Group	8980.53	3	2993.51	4.34	0.0050
Emot.	71019.06	5	14203.81	20.61	0.0000
G x E	6096.18	15	406.41	0.59	0.8833
Error	293556.06	426	689.10		

3-3-3-1 Between Groups Analysis of variance of total accuracy scores indicates that groups differ significantly in their level of total accuracy ($F = 4.34$, $p < 0.005$) (See table 3-6 for Anova summary). From table 3-5 and figure 3-1 it can be seen that group one (violent offenders) are the most accurate (mean across emotions = 67.48), next accurate are groups three and four (dishonesty offenders and anti-social & drug offenders, respectively) (mean across emotions = 59.52 & 60.32, respectively). Group two (sexual offenders) were the least accurate (mean across emotion = 55.73).

3-3-3-2 Between Emotions Total accuracy scores for each subject were analysed with respect to emotion. Significant differencres were found in the accuracy with which prisoners recognised the six target emotions ($F = 20.61$, $p < 0.0001$). From table 3-5 and figure 3-1 it can be seen that overall, prisoners identified happiness most accurately (mean across groups = 83.25). They identified surprise the next most accurately (mean across groups = 73.65), then sadness (mean across groups = 58.82), disgust (mean across groups = 56.69), anger (mean across groups = 46.40). Fear was the least accurately recognised emotion

(mean across groups = 46.18).

3-3-3-3 Group x Emotion Total accuracy scores were analysed to determine two way (group x emotion) effects. As table 3-6 shows no significant effect was found (F = 0.59, p = 0.8833).

3-3-4 DISTRIBUTION OF CORRECT AND INCORRECT HITS

To determine whether subjects incorrect hits approached a level where they may confuse emotions indistinguishably (ie are unable to distinguish the target emotion from other emotions) one needs to determine how frequently incorrect hits were made to each non-target emotion compared to the frequency of correct hits. These figures are presented in table 3-7 in the form of mean percentages of probes responded positively to for each group for each emotion. For example, the the first row indicates that when group one members (n = 21) were shown six slides of faces swowing surprise, on 117 occasions they responded "yes" to the "surprise ?" probe.

$$\text{So:} \quad \frac{117}{21 \times 6} \times \frac{100}{1} = 94\ \%$$

Thus, because this cell represents correct resonses to a target emotion, this score is identical to the mean correct hit score. In the same manner, the second cell indicates that on the 126 occasions (21 subjects x 6 slides) that group one subjects were asked if a surprise photograph showed fear, 37 % of the time they resonded "yes". These scores are presented graphically in figure 3-5.
Scores are presented in descending order of frequency.

From this figure it can be seen that a common pattern of confusion exists between groups. All groups, for instance, most commonly confused surprise with fear, then happiness. Conversely, all groups most commonly confused fear with surprise. Disgust is most often confused with anger by all

groups and anger is alternately, most often confused with surprise. When viewing happy faces all groups confused surprise with happiness. Groups one, two and four most commonly confused sadness with disgust, while group three most commonly confused sadness with fear.

table 3-7: Percentage of Emotion Probes Responded Positively To.

Group	Target Emotion	Sp	F	D	A	H	Sd
1	Surprise	94*	37	10	5	18	10
	Fear	70	86*	31	21	1	41
	Disgust	9	10	81*	69	0	21
	Anger	21	14	53	77*	1	26
	Happiness	21	2	2	2	94*	1
	Sadness	9	22	26	18	0	87*
2	Surprise	81*	32	15	9	18	12
	Fear	58	70*	29	20	6	19
	Disgust	17	25	73*	44	0	23
	Anger	25	29	57	69*	2	21
	Happiness	33	7	7	7	89*	7
	Sadness	17	27	29	21	2	75*
3	Surprise	92*	33	11	2	13	9
	Fear	76	63*	22	9	2	20
	Disgust	20	19	77*	41	0	9
	Anger	15	30	44	78*	0	19
	Happiness	20	0	4	0	92*	2
	Sadness	9	35	30	9	2	64*
4	Surprise	88*	29	16	8	17	8
	Fear	55	78*	31	27	1	23
	Disgust	16	14	78*	47	2	19
	Anger	21	26	60	66*	2	26
	Happiness	31	4	4	3	90*	2
	Sadness	17	29	33	17	1	79*

* represent correct hits
remaining cells are incorrect hits

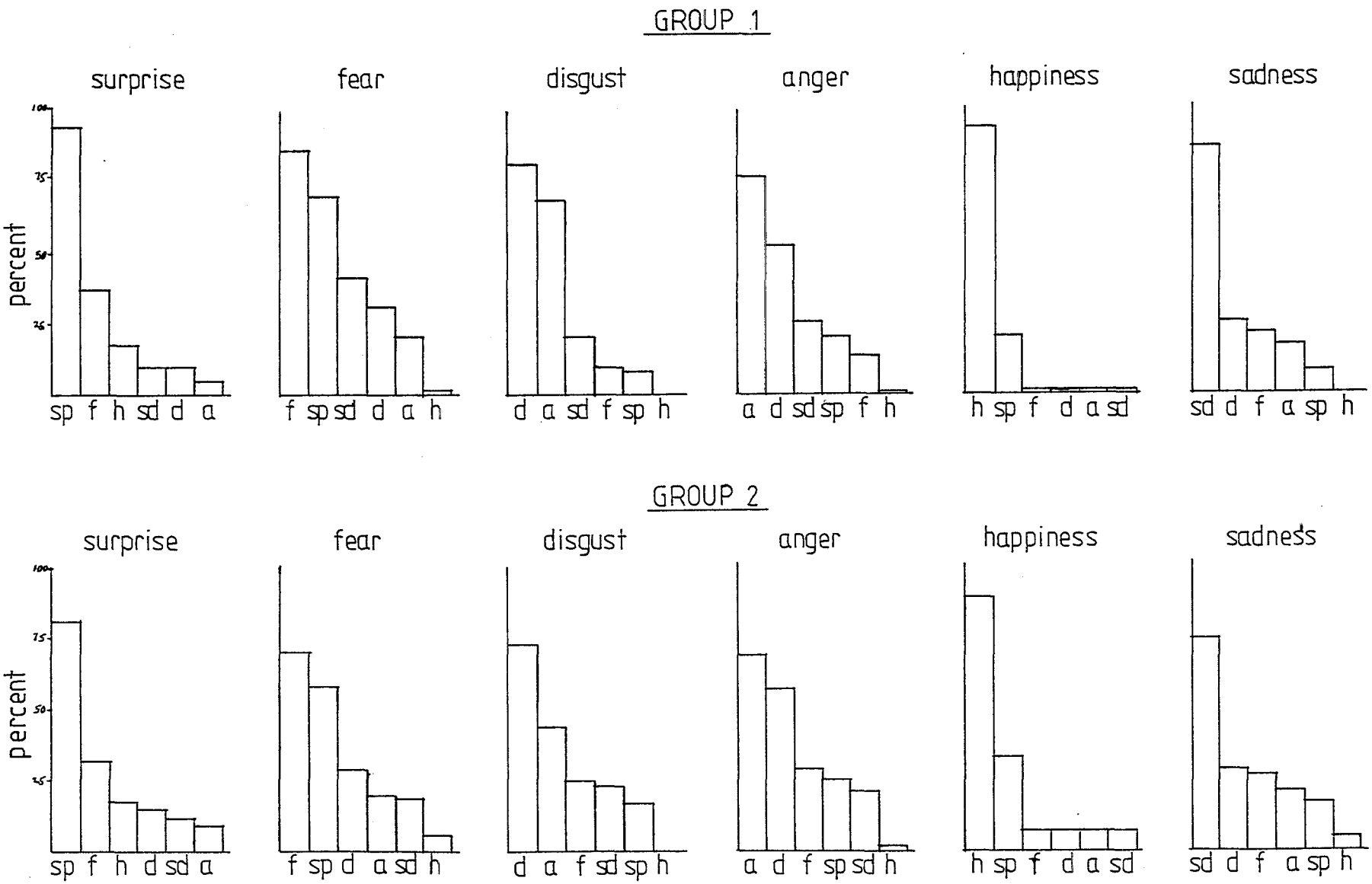

figure 3-5 Percentage of positive responses to each emotion probe for each target emotion.

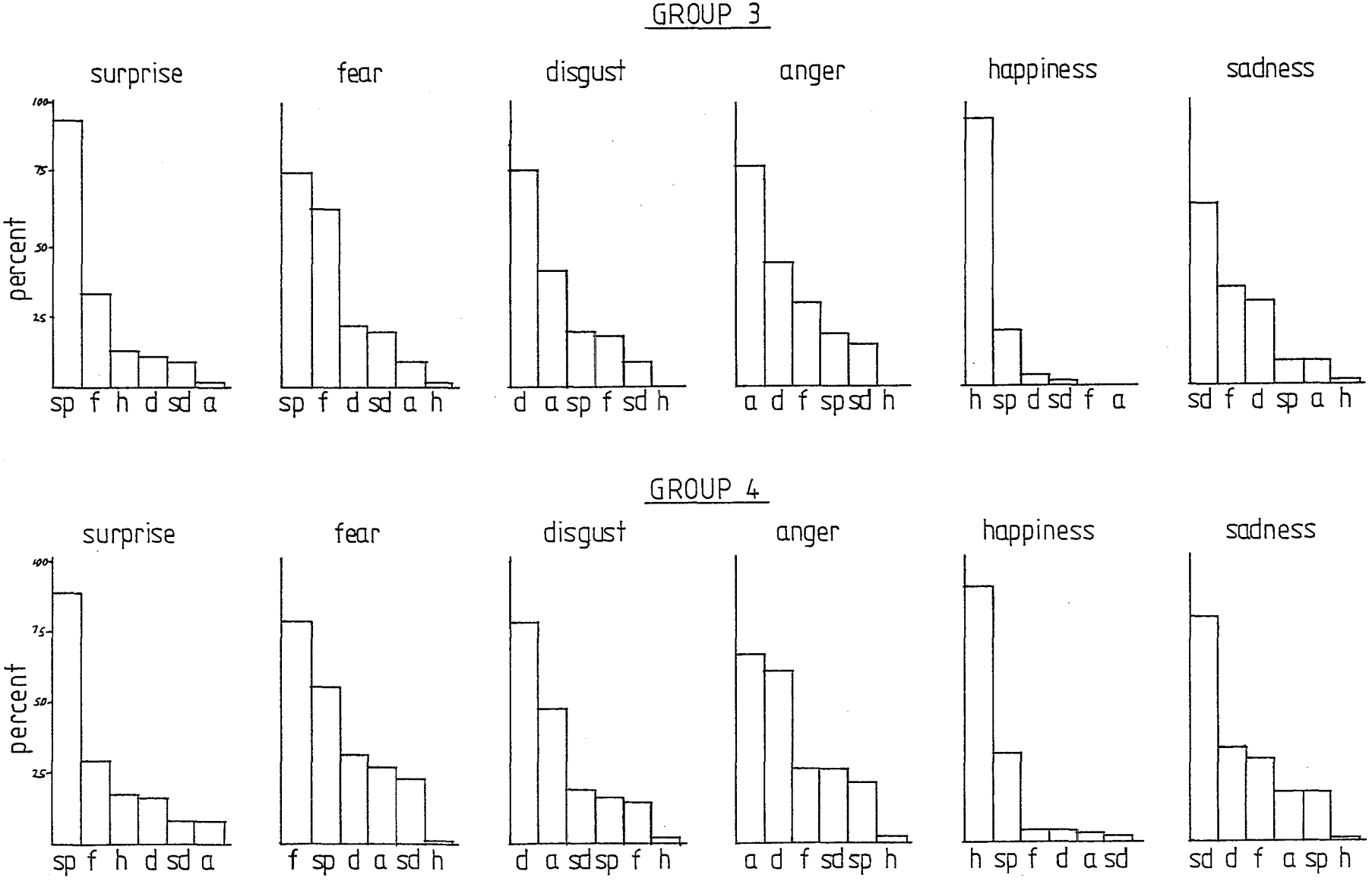

figure 3-5 - continued -

From table 3-7 and figure 3-5 it can be seen that subjects rated some non-target emotions as being present in faces nearly as often as target emotions. Group one, for instance, rated fear photographs as showing fear 86 % of the time and surprise 70 % of the time. T tests were conducted on groups responses to emotions, comparing the emotion prode most frequently responded to (in all but one case the target emotion) with the emotion probe second most frequently responded to. In most cases these produced significant differences, suugesting (statistically at least) that subjects could discriminate the target emotion from the others. Several were not significantly different however. When group one was shown photographs of faces disgust they rated these faces as showing disgust 81 % of the time and anger 69 % of the time. When these results were submitted to a t test responses to anger and disgust probes were found not to be significantly different (at the .05 level). Similarly, when group two members were shown fear photographs their responses to fear probes and surprise probes were not significantly different (at the .05 level). When group two members were shown photographs of anger they could not distinguish between anger and disgust.

When group three was shown fear, they responded to the surprise probe more frequently than the fear probe. These frequencies were not significantly diiferent (at the .05 level). When group three members were shown disgust photographs they failed to distingyish between disgust and anger (at .05 level) and when shown anger photographs they failed to distinguish between disgust and anger (at .05

level). Further, when group three members were shown sadness photographs they failed to ditinguish between sadness and fear (at .05 level). Finally, when group four members were shown photographs of anger they failed to distinguish between anger and disgust (at.05 level).

PART FOUR

DISCUSSION

4 DISCUSSION

4-1 Group Differences in Recognition Accuracy

From the above results a number of conclusions can be made about prisoners ability to recognize emotion in facial expression. The results partially confirm the hypothesis that offenders against the person perform less well than those who commit crimes of dishonesty or antisocial and drug offenders. Sex offenders were consistently rated as the least accurate of the four groups in the three measures used. Overall they produced the lowest number of correct hits and the highest number of incorrect hits (although group differences on this measure were not statistically significant). When these two measures were arithmetically combined sex offenders were again the least accurate of the four offender groups.

Contrary to the hypothesis though, those subjects with a predominent history of violent offences were overall more accurate at recognising emotion in facial expression than the other three groups. They produced the highest number of correct hits and when incorrect hits were subtracted from correct hit scores to provide an indication of overall accuracy violent offenders retained the highest scores.

The performance of antisocial and drug offenders were very similar to those of dishonesty offenders on all three measures of accuracy suggesting that there was little difference between these two groups in their ability to recognise emotion in facial expression.

In relation to previous findings these results produce some interesting challenges. Toch's (1972) assertion that violence prone individuals are deficient in social skills

and that this deficiency produces violence requires qualification in the light of the present findings. From the current study it appears that violent offenders fare better than other offender groups in terms of social perception skills (which may be seen as one prerquisite to effective social skills). From this it may be assumed that violent offenders are just as capable as other offenders, if not more so, at registering the intentions of others and receiving feedback from a victim reregarding emotion. It is unlikely, therefore that a simple deficit in the ability to perceive emotion in facial expression is alone a significant etiological factor in the persistant recurrence of violent acts in some individuals.

From figure 3-4 (Results section) it can be seen that violent offenders have the greatest difficulty in recognising the emotions of fear and anger, though they were still more accurate at recognising these emotions than the other three groups. It is interesting to note though that when violent offenders were shown anger slides they were able to statistically discriminate between anger and disgust (using a t test). When they were shown slides of disgust, however, they rated these as showing anger with such a frequency that statistically it could be said that they were unable to discriminate between anger and disgust. This "over-sensitivity" to anger (ie perceiving anger in disgust faces) is unique to the violent offender group and may be a contributing factor to their actions in some situations.

It is possible that while violent offenders showed greater accuracy than other groups of offenders in the

judgement task of the present situation, this ability may be diminished or distorted in other situations. It is interesting to speculate, for instance, on the effect that alcohol may have on the social perceptual abilities of violent offenders, considering the wealth of evidence indicating an association between alcohol and violence (Evans, 1980; Myers, 1984). In a survey of admissions to a psychiatric unit attached to an Australian prison, Glaser (1985) found that 76 % of admissions admitted to the abuse of alcohol at the time of committing the offence. A recent study assessing the effects of alcohol on judgements of facial expression of emotion found that subjects (social drinkers) who had consumed high amounts of alcohol made more errors than placebo subjects or subjecs who had consumed low doses of alcohol (Borrill, Rosen & Summerfield, 1987). The specific effect of alcohol on the emotional recognition abilities of violent offenders remains to be assessed but is an interesting extention of the work presented in this study.

The current study may help to clarify the previous inconsistent results regarding the social perceptual skills of sex offenders. Whilst deficiencies in inter-personal social skills have been hypothesized as eitiological factors in the occurence of sexual offences (Abel, Becker, Blanchard & Djenderedjian, 1978), studies have not found a social skills deficit unique to rapists (Stermac & Quinsey, 1986), nor a deficit in the ability to interpret interpersonal information (Giannini & Fellows, 1986). The current study found, however that sex offenders were the least accurate of the four offender groups at recognising

emotion in facial expression. Whilst these results seem to be at odds with those of Giannini & Fellows (1986) it may be that the differences are accountable for in terms of the characteristics of the tested populations. Giannini & Fellows study reported that rapists had an enhanced ability to interpret non-verbal facial information. Subjects for this study were a highly selected group of self- confessed, nonincarcerated offenders whereas the current study used subjects whose offending had come to light as a result of police investigation and who were subsequently imprisoned for the offence. It could be argued that the current group of sex offenders had less insight into their condition and less motivation to seek professional help for any perceived difficulties. than Giannini and Fellows' group. If nothing else this difference serves to illustrate the heterogeneity of sex offenders as a group.

Stermac & Quinseys' (1986) utilized incarcerated indivduals but their study was concerned with more global measures of social competence and did not take into account the specific social perceptual skills of subjects which the current study examines.

From the current study it may be concluded that some sex offenders have considerable difficulties in recognising emotions in facial expression. As noted above, sex offenders achieved the lowest correct hit rate and made the most confusions (incorrect hits) of all four offender groups. Examination of figure 3-4 indicates that sex offenders had the greatest difficulty recognising the emotions of fear and anger. Further examination of table 3-7 and figure 3-5 indicates that sex offenders most often

confused fear with surprise when viewing fear. Indeed statistically they were unable to discriminate between these two emotions. When viewing anger they often confused it with disgust to the extent that statisically there was no difference in their response rates.

Again it is interesting to speculate what effects alcohol might have on the recognition abilities of sex offenders. Assuming that the subjects were sober at the time of testing, it may be that these results over-estimate the recognition abilities of some subjects. Alcoholism and drug abuse have been reported to be predominant secondary diagnoses in rapists (Henn, 1976) and rape and substance abuse have been correlated in homes with familial dysfunction and also unhealthy expressions of intimacy and sexuality (Coleman, 1982).

Giannini & Fellows (1986) hypothesize that the enhanced ability to read non- verbal meassages they found in their sex offender subjects might arise from a greater need to use any mechanisms to attempt to decipher the confused attitudes felt to be characteristic of the rapists home. Concerning the current subjects it might equally be hypothesized that such confused home attitudes contribute to a lasting deficit in the ability to decipher non- verbal messages from others.

Overall, anti-social & drug offenders and dishonesty offenders performed at a similar level in terms of correct hits, incorrect hits and total accuracy scores. Examination of figure 3-4 does indicate some differences between these groups in terms of recognition of specific emotions. Anti-social and drug offenders were more accurate than

dishonesty offenders at recognising surprise, anger and happiness, indeed they identified surprise more accurately than any other group (but identified fear the least accurately of any group). Dishonesty offenders, on the other hand, identified the emotions of fear, digust and anger more accurately than the anti- social and drug offence group. They were however the least accurate of any group at identifying anger.

Analysis of figure 3-5 indicates some of the specific confusions that anti- social and drug offenders made. When viewing photographs of fear they were more likely to label these as showing surprise, the only incident in the current study where a group has labeled an emotion more often as showing a nontarget emotion than a target emotion. T tests also indicate that these subjects were statistically unable to discriminate between anger and disgust when viewing anger and sadness and fear when viewing fear. Differing from other subjects anti- social and drug offenders were more likely to confuse sadness with fear rather than disgust. These results need to be interpreted cautiously as this group had a small number of subjects ($n = 9$) thus influencing the critical values of t. Dishonesty offenders were unable to discriminate between anger and digust when viewing anger photographs.

The similarities between these two groups in terms of accuracy levels and also in terms of response profiles may in part be due to the overlapping characteristics of the subject populations in that dishonesty offenders tended also to have numerous convictions for anti-social acts and drug offences while those classed as anti-social and drug

offenders also had high offence rates for dishonesty crimes.

4-2 Differential Accuracy of the Six Target Emotions

Considering the responses of each of the four groups to each of the six emotions a fairly consistent pattern of confusion is evident. All groups were most likely to confuse surprise with fear, fear with surprise, disgust with anger, anger with disgust and happiness with surprise. Three groups confused sadness most often with disgust while one confused sadness most often with fear. Apart from this latter example there were no particular confusions that were idiosyncratic to one particular group. Thus there were no significant group x emotion effects when responses were analysed. It can be said from this that groups differed quantitatively but not qualitatively in their recognition of emotion in facial expression.

4-3 Comparisons With Non-Prison Populations

The consistent confusions that prisoners as a whole did make can be compared with those made by non prison populations reported in previous studies to determine whether prisoners confuse different patterns of emotions than non- prisoners. The results of Russell & Bullocks' (1986) study indicate that similar to prisoners, normal adults are most likely to confuse anger with disgust, disgust with anger, sadness with disgust, happiness with surprise, and fear with surprise. Where prisoners were most likely to confuse surprise with fear, adults in Russell & Bullocks study were most likely to confuse it with happiness. In an earlier study though (Bullock & Russell, 1984) adults were more likely to confuse surprise with fear as in the current instance.

From these common confusions Bullock & Russell (1984) built the circular model illustrated in figure 1-2. Comparing the confusions made by subjects in the current study with those made by other subjects it could be hypothesized that if reponses to the six emotions probed in the current study were placed spatially (so that the more often they were confused the closer they were placed together) a circular arrangement similar to that in figure 1-2 would result. From this it could be argued that prisoners cognitive schema of emotions is similar to that of the normal adult population again confirming that differences between prisoners and non-prisoners are quantitative rather than qualitative.

Comparisons can also be made between the ranking of accuracy scores of prisoners and those obtained from

non-prison populations. From table 3-3 and figure 3-8 it can be seen that prisoners identify happiness the most accurately, then surprise, sadness, disgust, anger and fear. Kirouac & Dore (1983), using Ekman & Friesens' stimulus material found that university students most accurately identified happiness, then surprise, disgust, anger, sadness and thenfear, a similar ranking except for the placement of sadness. Similarly, adults in Bullock & Russells' (1984) most accurately identified happiness, then sadness, anger, disgust, fear and surprise. Again, a similar ranking to the prisoners in the current study with the exception of the placement of surprise.

Carlson, Ganty & Masters (1983) suggest that differences in adults accuracy between emotional categories may have been influenced by variation in the base rates with which subjects use affect labels. An individual who judges everyone to be happy, for example, will always be accurate when the person being judged happens to be happy and the individual who seldom uses the category fear may by doing so reduce his/her accuracy in recognising fear when it is truely present. Considering that prisoners on the whole are similar in terms of differential accuracy it could be hypothesized that they have shared common past experiences which have influenced the base rates with which they observe particular emotions. It could also be asked to what extent the prison environment contributes to this differential accuracy in the same way that Gunn (1977) asks to what extent apparent mental illness in prisoners may be more clearly related to the prisons' functions as institutions than to any special relationsip between crime

and mental disorder. Whilst it is conceivable that male incarcerates might deny the feeling of fear as being present in themselves and others, contributing to a low base rate and subsequent low recognition accuracy rate it seems less plausible that such could also be the case for anger which also ranked low in terms of differential accuracy. It is beyond the scope of the present study to conclude what the effects of the prison environment might be on the differential accuracy rates of the various emotions but it is interesting to note that the group whose subjects were consistently the least accurate was also the group whose subjects had spent the longest average time in prison. The effects of the prison environment on the ability to recognise emotion in facial expression might be tested further by comparing the results of subjects who had been imprisoned for some time and had a history of previous sentences with recent incarcerates who have no previous prison histories.

The method used in the current judgement study allowed subjects to place more than one label on each stimulus photograph. This enabled an extensive picture to be formed of the types of confusions subjects made. Because this model was used rather than the more common selection of a photograph from an array to match an emotional label, comparisons between accuracy scores in this study and others are hindered. Some tentative comparisons may be made between the correct hit rate scores of the current study and accuracy rates of other studies which have used Ekman & Friesens' stimuli to determine how prisoners compare with normal subjects in terms of accuracy of recognition. The

accuracy rates reported by Kirouac & Dore (1983) for university students ranged from 97 % for happiness to 83.11 % for fear. The adults in Bullock & Russells' (1985) study achieved accuracy scores ranging fom 100% for anger to 71 % fo surprise. The norms provided with Ekman & Friesens' material vary for each slide but nearly all are in excess of 90 % and many approach 100 %. Whilst thre is some variability inthese reported accuracy scores, it seems that it is not uncommon for normal adults to achieve accuracy rates for all six emotions in excess of 90%. In the current study very few of the cells in table 3-1 excede 90 % and further the correct hits score alone is likely to over estimate the accuracy scores of subjects as it ignores other errors. From these comparisons, it could be hypothesized that adult prisoners are not as accurate as other non-criminal subjects in recognizing emotion in facial expression. This of course requires further testing with controlled studies.

At this point it is also worth restating the point made in section 1-3-2 that the use of posed still photographs in judgement studies may lead to an overestimate of recognition accuracy in that they do not account for the confusion that may result from deliberate attempts at deception by the encoder or disconcordant combinations of facial expressions and situational factors. It is not known from the current study how prisoners fare on these more complex examples of social perception but one could speculate that the more complex the parameters the less accurate the resulting judgements.

4-4 Limitations of the Current Study

The current study utilized a methodology which in many ways makes it a considerable improvement on previous studies. The use of this methodology (allowing subjects to respond to stimuli with more than one emotional category thereby approximating a free choice situation) meant that comparisons with other judgement studies could however only be tenuous. Further testing is required with a suitably matched control group. A further limitation of the current study is the small number of subjects used, which in the case of group three was only nine.

Whilst studies discussed in section 1-4-3 tend to conclude that general intelligence has little influence on emotion judgement skills the present experimental task had a considerable verbal component and it may be that those subjects who were the most accurate had the advantage of a better understanding of the emotional labels used. Results were not analysed to determine if accuracy scores correlated with intelligence.

Section1-3-4 noted that characteristics of the poser might influence judgement accuracy. The current results could be further analysed to determine if the race and sex of posers has any differential effect on judgement accuracy. Dellinger (1978), examining the effects of stimulus models' race and sex on prisoner subjects verbal responses, found no significant differences in production of affect and self-reference units between groups who viewed a black model and those who viewed a white model but a significantly greater amount of affect produced and self-reference units by subjects who viewed a female model

than those who viewed a male model which suggests that prisoners might be more responsive to female posers.

Further analysis might also be done to determine if length of time incarcerated and the influence of alcohol and drugs also influence judgement accuracy in prisoners.

4-5 Classification of Prisoners

The current study utilized the overall criminal careers of subjects to categorize them. Megargee (1977) commented that such classifications often encounter difficulties because criminals engage in such a variety of illegal activities that it is difficult to categorize their career and certainly the attempts in the current study to classify subjects by statisical methods was unsuccessful because subjects varied so greatly in terms of offence histories. Because of this difficulty the current study had to resort to a more subjective method of classifying the prisoners. This, however, had certain advantages in that it allowed extra weight to be given to more serious offences the significance of which was lost in the statistical analysis. The current classification meets all the requirements Megargee deems necessary in a taxonomic classification system. It was complete in that it was possible to classify all the subjects into one of the eight categories. Each category was clearly operationally defined so that each subject was classified with a minimum of ambiguity. It was reliable in that two raters achieved an inter- observer reliability score of 91 %. It has validity, being based on the local police offence code and it is economical. Finally, it has implications for treatment.

4-6 Implications of the Results

Whether the perceptual skills deficits found in prison subjects are factors which contribute to an individual offending in a particular way or whether they are a result of this offending and subsequent incarceration cannot be determined from this study due to the lack of significant group x emotion effects. The fact that overall deficits exist does however have future-based implications for treatment. With data consistently confirming that accurate social cognition is related to effective social behaviour (Ford, 1982), advocates of social skills training for offenders such as rapists may have to take a figuretive step backwards and consider the importance of not only training offenders in specific social skills but also teaching them judgement skills so that they have some indication of when to put these skills into action and what the response of others is to this. With the recent trend towards providing social skills training for incarcerated individuals continuing, the conclusion of Morrison & Bellack (1981), that a behavioural analysis which fails to consider social perception is incomplete, is pertinent.

4-7 Conclusions

The following conclusions can be made from the current study:

1) Offender groups differ in their overall accuracy of judgements of emotion in facial expression. Specifically, the current study found violent offenders to be the most accurate and sexual offenders to be the least accurate. Anti-social & drug offenders and dishonesty offenders fell midway between the two former groups.

2) Offenders recognized the six target emotions with differing degrees of accuracy. Overall, they recognized happiness the most accurately, then surprise, sadness, digust and anger. They identified fear the least accurately.

3) Offenders consistently confused some pairs of emotions: surprise with fear, fear with surprise, disgust with anger, anger with disgust, happiness with surprise and disgust with sadness. Certain groups of offenders were statistically unable to discriminate between some of these pairs.

4) Offenders make confusions between emotions similar to those made by non- offenders and that based on differential accuracy of recognition, emotions are ranked in a similar order to non-offenders.

From these conclusions another two may be tentatively made:

5) As offenders confuse similar patterns of emotions to non-offenders their internal schema of emotions is not qualitatively different from non- offenders.

6) Overall prisoners are not as accurate as

non-prisoners in recognising emotion in facial expression.

These findings have important implications regarding the inclusion of social perception components in social skills training andtreatment of offender groups.

The current study leaves several questions unanswered and creates new avenues for future research. The following points were speculated on but require further study:

1) The role of social perceptual deficits as contributing eitiological factors to offending and relatedly:

2) The direct effects of the prison environment on social perception skills.

3) The effect of substance abuse on emotional recognition in prisoners.

4) The effect of race and sex of poser on emotional recognition in prisoners.

5) The influence of verbal IQ on accuracy scores in judgement studies with prisoners.

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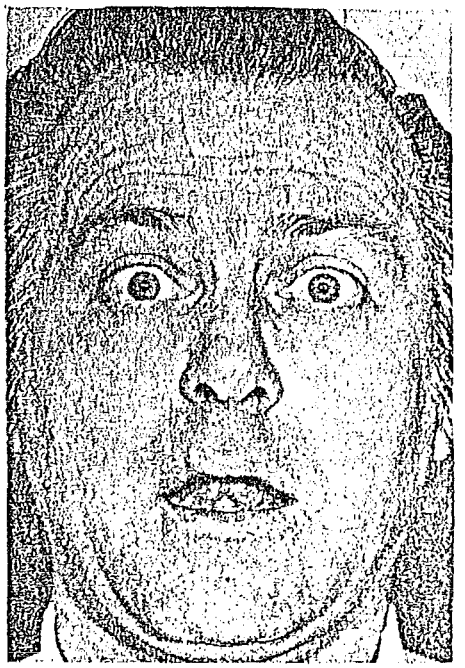
APPENDICES

APPENDIX A

Photographs	Emotion
1-6	Surprise
7-12	Happiness
13-18	Disgust
19-24	Anger
25-30	Happiness
31-36	Sadness

1)

2)



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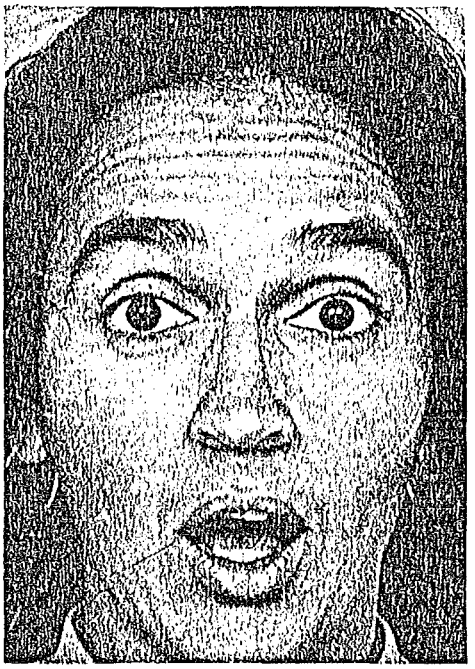

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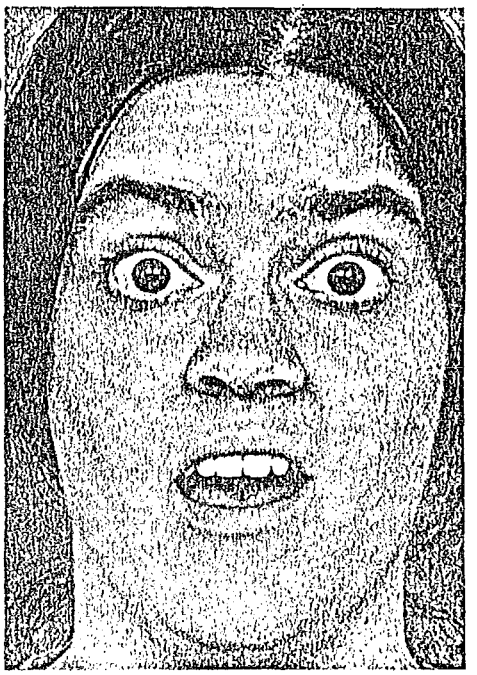

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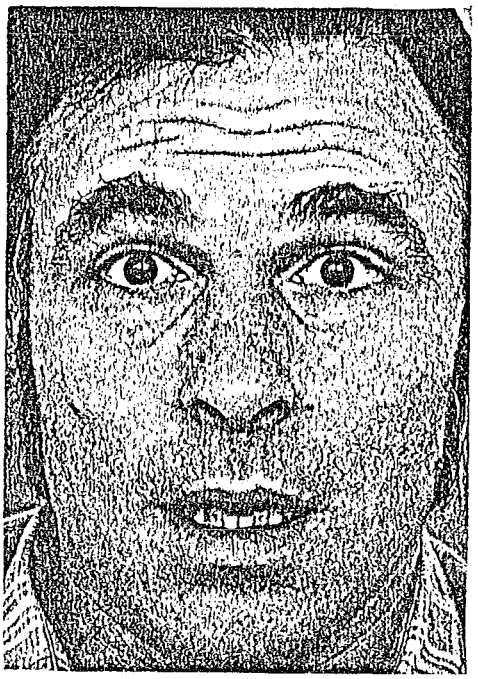

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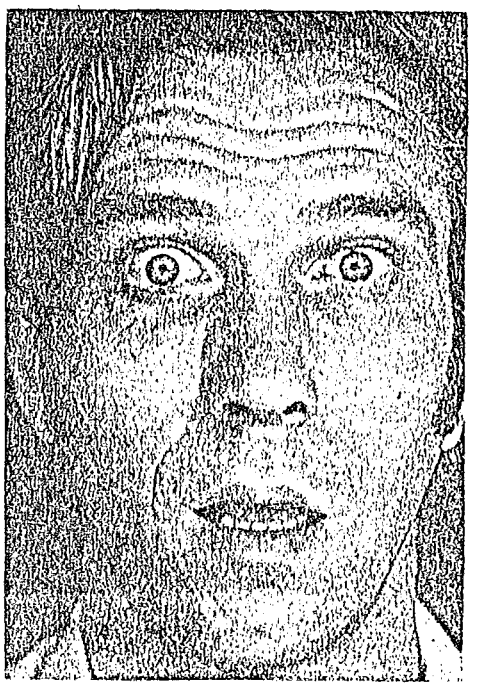

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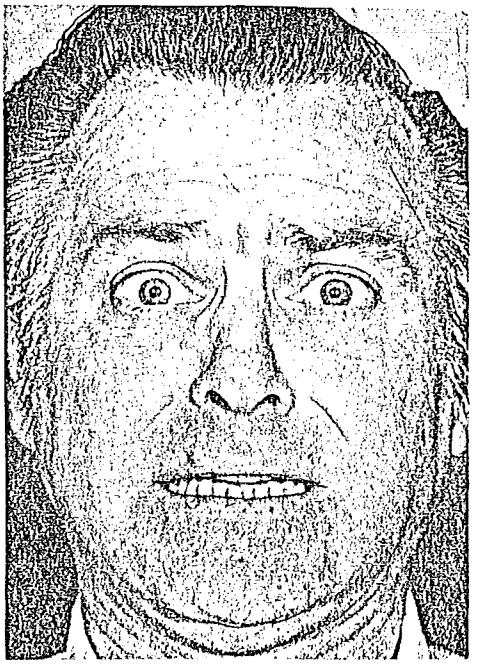

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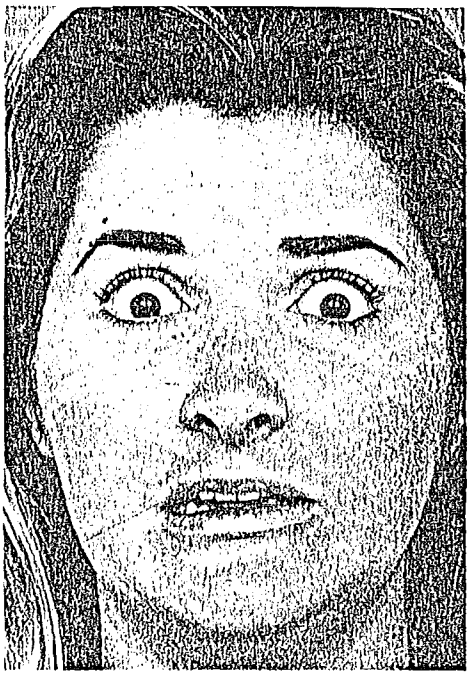

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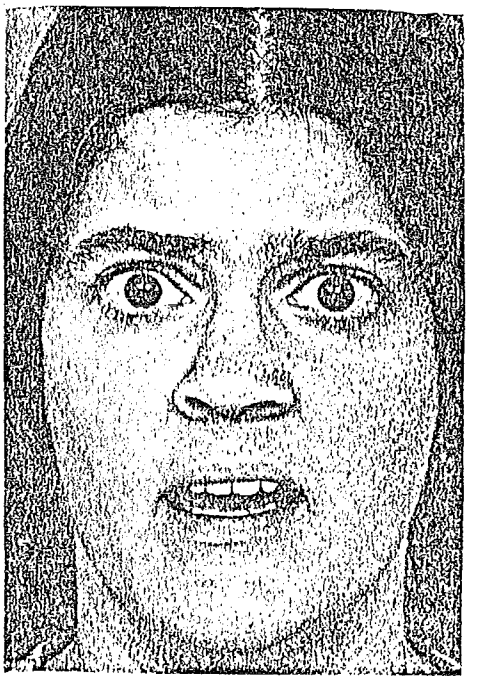

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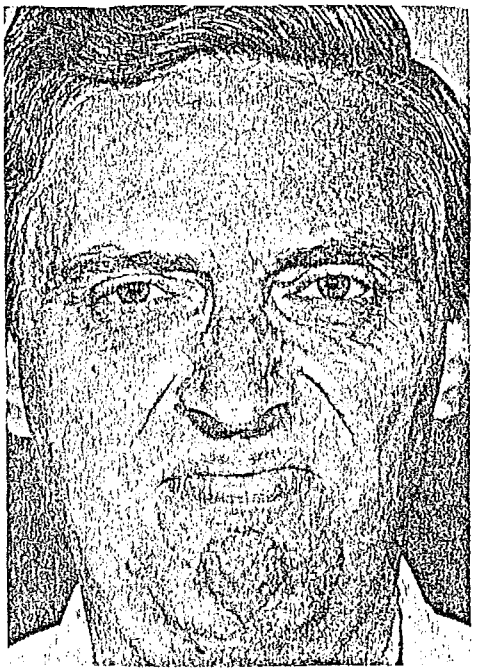

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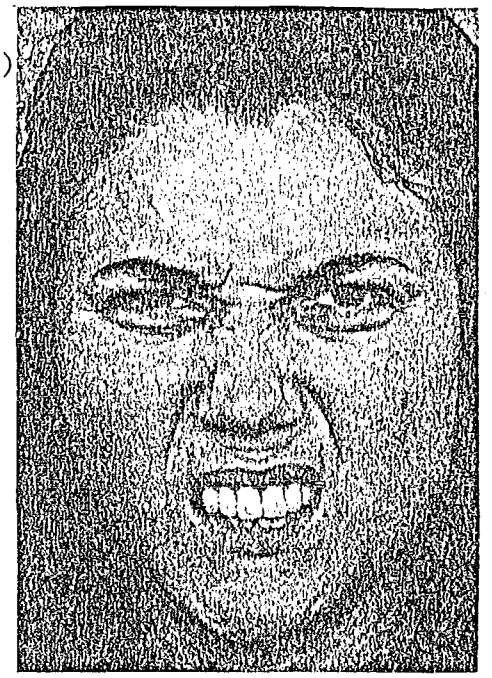

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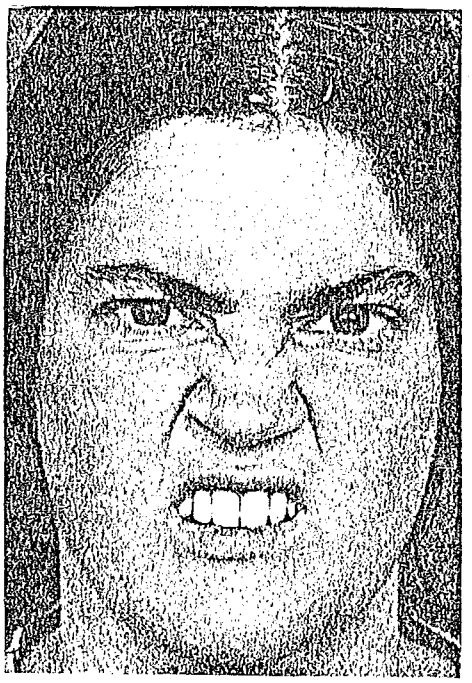

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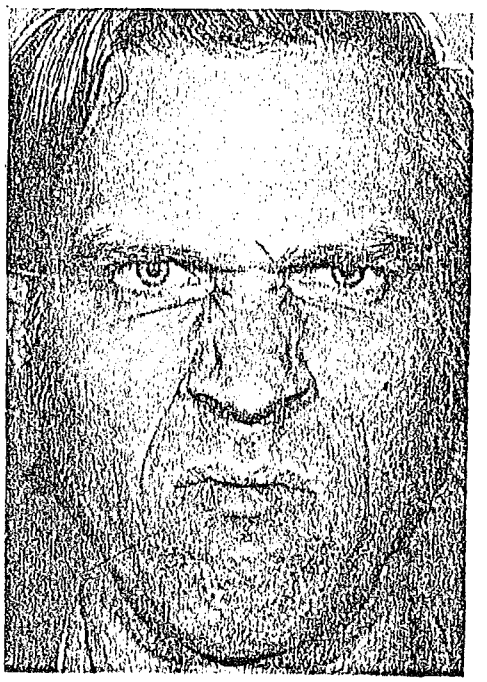

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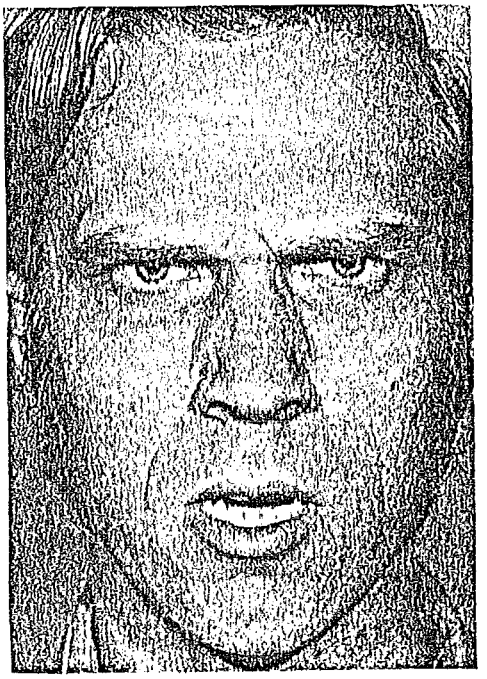

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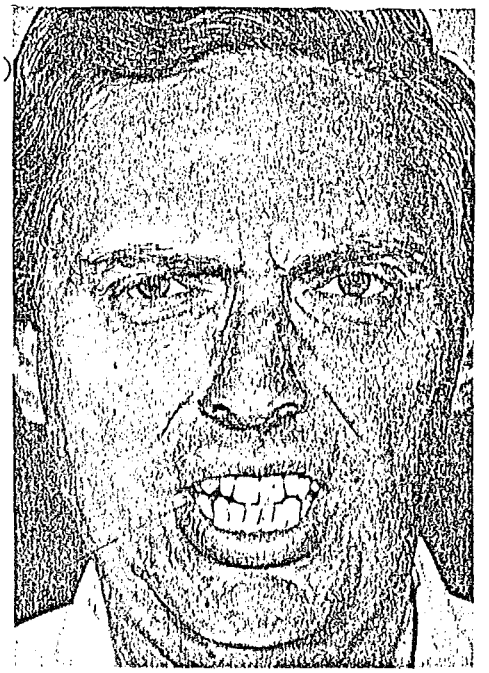

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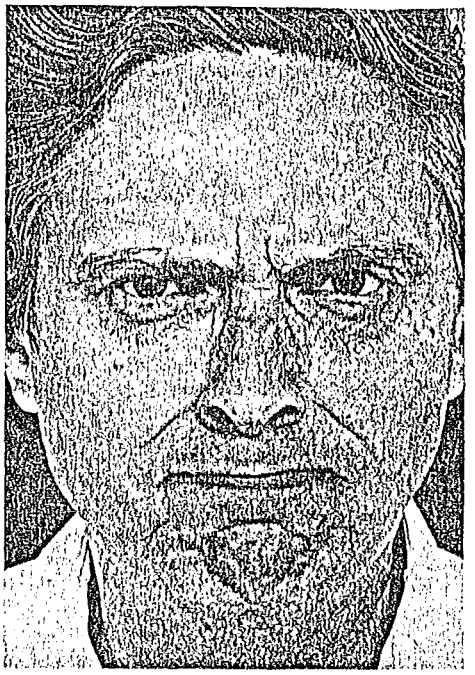

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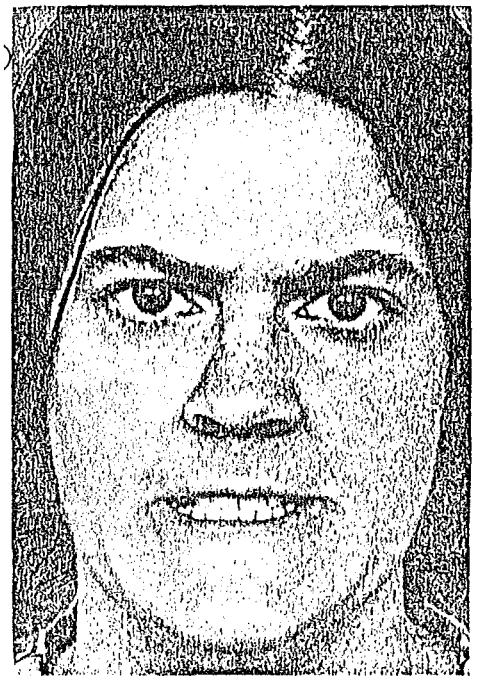

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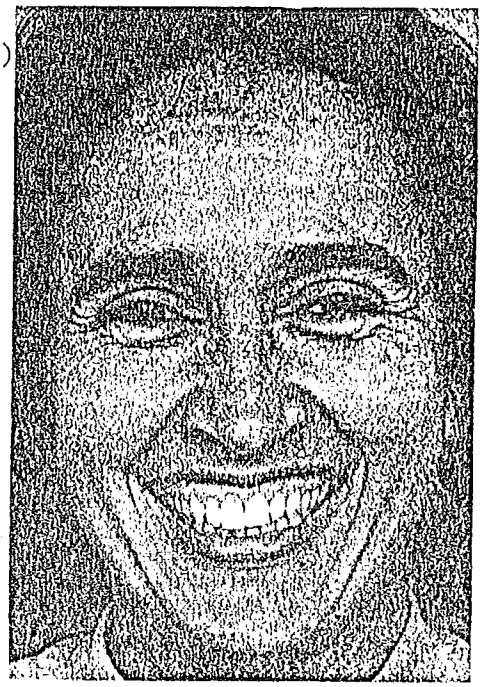

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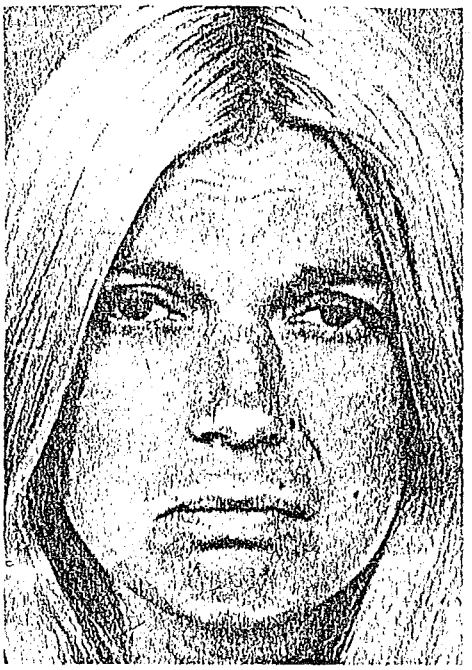

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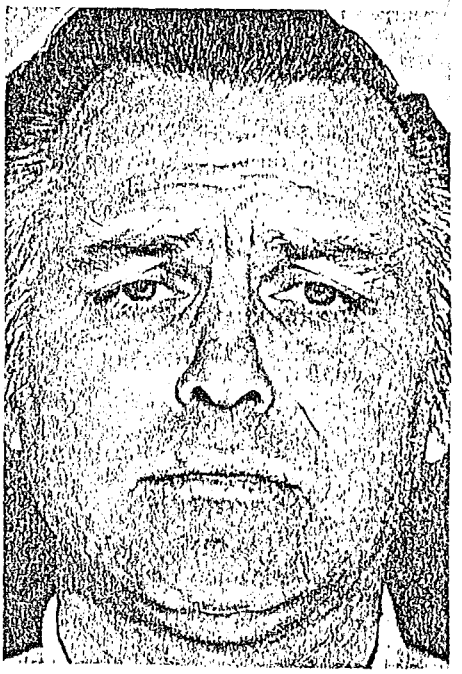

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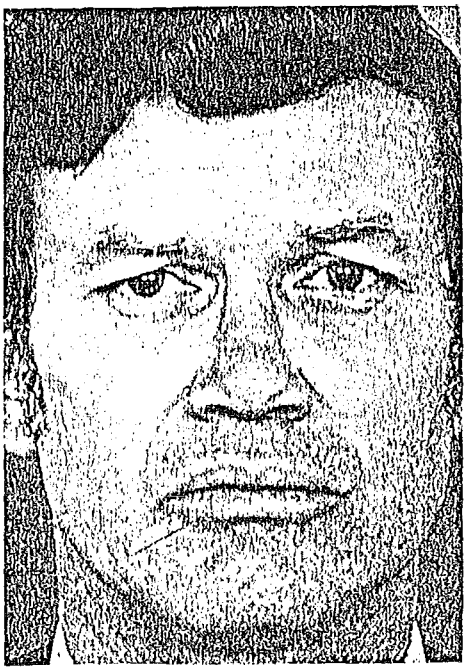

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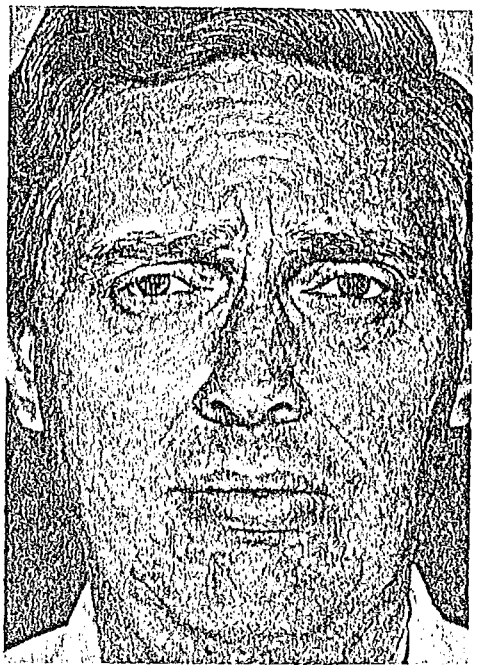

APPENDIX B

INFORMATION QUESTIONAIRE

Name:_____ Age: years: _____ months: _____
Race:_____

CURRENT SENTENCE
- -length:_____
- -amount already served:_____
- -time spent in remand prior to current sentence:_____
- -offence:_____

PAST OFFENCES
- -first offence:_____ age: _____
- -summary of subsequent offences:_____
- -details of prison sentences:

age	offence committed	sentence	institution	time served

PERSONAL
- -Family structure:
  parents: natural adopted foster
  married seperated divorced widowed age:
  siblings: brothers:_____ sisters:_____
- -Marital status: single engaged married remarried seperated
  divorced widowed
- -Current relationship:_____
- -Length of marriage/relnship:_____
- -Children:_____
- -Age left school:_____ Highest level achieved:_____
- -Additional edcn/training:_____
- -Usual occupation:_____
- -Occupation during 6 months prior to prison:_____
- -Admissions to psychiatric hospitals/contact with psychologists etc:_____
- -Past major illnesses/accidents:_____
- -Present disabilities:_____
- -Present medication:_____

APPENDIX B continued

-Major life crises:_____

_____

_____

_____

-Social/personal consequences of entering prison:_____

_____

_____

_____

-Do any of the following apply to you:

head aches	dizziness	fainting spells
palpitations	stomach trouble	no appetite
bowel disturbances	fatigue	insomnia
nightmares	take sedatives	alcohol abuse
feel tense	feel panicky	tremors
depressed	suicidal ideas	take drugs
unable to relax	sexual problems	shy with people
dislike wkends/vacations	overambitious	cant make friends
inferiority feelings	bad home conditions	cant keep a job
memory problems	unable to have a good time	
financial problems	concentration difficulties	

-Do any of the following words apply to you: worthless useless a nobody life is empty inadequate stupid incompetent naive cant do anything right guilty evil morally wrong horrible thoughts hostile full of hate anxious agitated cowardly unassertive panicky ugly aggressive deformed lonely unloved misunderstood unattractive unconfident in conflict in conflict full of regrets worthwhile sympathetic intelligent attractive confident considerate bored restless repulsive depressed confused

APPENDIX C

Short Stories Used In Recognition Tests

1. If a person's best friend moved away they would be very unhappy. The person would be very sad.

2. A person was driving a bus along the road when suddenly a dog ran out straight in front of the bus. The bus driver got a real surprise.

3. If a person met somebody who had not had a wash, bath and shower for a month they would smell really bad. The person would smell disgusting.

4. If you do something you are told not to do, a person will be displeased with you. The person will be angry or mad with you.

5. If a person is afraid of big dogs and one day they open their back door and find a big fierce dog running towards them, they would be very

6. If a person was given a present they had always wanted for their birthday they would be glad. The person would be very happy.

APPENDIX D

NAME: _____ DATE: _____

Presentation	Slide No	Emotion Shown/Response Given					
1		A	Sp	Sd	H	D	F
2		F	D	H	A	Sd	Sp
3		F	H	Sd	A	D	Sp
4		D	Sp	F	A	H	Sd
5		D	Sd	F	H	Sp	A
6		A	H	Sd	F	Sp	D
7		Sp	D	F	A	H	Sd
8		D	A	H	Sd	Sp	F
9		A	Sp	Sd	F	D	H
10		Sd	A	H	F	Sp	D
11		H	D	Sp	F	Sd	A
12		F	D	A	Sp	Sp	H
13		F	D	Sd	Sp	A	H
14		H	Sd	D	Sd	A	F
15		F	Sd	H	D	A	Sp
16		D	Sp	A	H	F	Sd
17		Sd	A	D	Sd	H	F
18		F	Sd	A	D	H	Sp
19		F	D	Sp	A	Sd	H
20		F	Sd	D	H	A	Sp
21		F	A	Sp	D	Sd	H
22		H	Sd	D	Sp	A	F
23		Sd	F	H	Sp	D	A
24		Sp	A	F	D	Sd	H
25		H	D	Sp	Sd	A	F
26		H	Sd	F	Sp	D	A
27		A	F	Sd	D	Sp	H
28		D	F	Sd	H	Sp	A
29		D	H	Sd	F	Sp	A
30		H	D	Sd	Sp	A	F
31		F	A	H	D	Sp	Sd
32		H	A	Sd	F	D	Sp
33		Sp	D	Sd	F	A	H
34		F	Sp	H	Sd	D	A
35		A	F	D	H	Sp	Sd
36		A	D	Sp	F	Sd	H